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United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353)

COMMENTS OF THE UNITED STATES ON THE RESPONSES OF THE EUROPEAN COMMUNITIES TO THE THIRD SET OF QUESTIONS FROM THE PANEL TO THE PARTIES

August 21, 2009

TABLE OF REPORTS AND OTHER DOCUMENTS

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Brazil – Aircraft (Article 21.5 II) (Panel)	Panel Report, *Brazil – Export Financing Programme for Aircraft – Second Recourse by Canada to Article 21.5 of the DSU*, WT/DS46/RW/2, adopted August 23, 2001
Brazil – Tyres (AB)	Appellate Body Report, *Brazil – Measures Affecting Imports of Tyres*, WT/DS332/AB/R, adopted 17 December 2007
Canada – Aircraft (AB)	Appellate Body Report, *Canada – Measures Affecting the Export of Civilian Aircraft*, WT/DS70/AB/R, adopted 20 August 1999
Canada – Aircraft (Panel)	Panel Report, *Canada – Measures Affecting the Export of Civilian Aircraft*, WT/DS70/R, adopted 20 August 1999, as modified by the Appellate Body Report, WT/DS70
EC Comments on US RPQ XXX	Comments by the European Communities on the US Responses to Questions of the Panel Following the Panel's First Substantive Meeting with the Parties (December 21, 2007); Comments by the European Communities on the US Responses to Questions of the Panel Following the Panel's Second Substantive Meeting with the Parties (May 5, 2008)
EC FNCOS	Oral Statement by the European Communities at the First Substantive Meeting of the Panel with the Parties – Non-Confidential Session, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)(DS353)* (September 28, 2007)
EC FWS	First Written Submission of the European Communities, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)(DS 353)* (Feb. 9, 2007)
EC RPQ XXX	Answers by the European Communities to Questions of the Panel Following the Panel's First Substantive Meeting with the Parties (December 5, 2007); Answers by the European Communities to Questions of the Panel Following the Panel's Second Substantive Meeting with the Parties (April 14, 2008); Answers by the European Communities to the Third Set of Questions from the Panel (July 31, 2009)

EC SNCOS	Non-Confidential Oral Statement by the European Communities at the Second Substantive Meeting of the Panel with the Parties – Non-Confidential Session, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)(DS353)* (January 16, 2008)
EC SWS	Second Written Submission of the European Communities, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)(DS 353)* (Nov. 19, 2007)
India – Patent Protection (US) (AB)	Appellate Body Report, *India – Patent Protection for Pharmaceutical and Agricultural Chemical Products*, WT/DS50/AB/R, adopted 16 January 1998
Korea – Alcoholic Beverages (AB)	Appellate Body Report, *Korea – Taxes on Alcoholic Beverages*, WT/DS75/AB/R, WT/DS84/AB/R, adopted 17 February 1999
New Shorter Oxford English Dictionary	*The New Shorter Oxford English Dictionary on Historical Principles* (Clarendon Press, Oxford) (1993)
US – Softwood Lumber CVD Final (AB)	Appellate Body Report, *United States – Final Countervailing Duty Determination with Respect to Certain Softwood Lumber from Canada*, WT/DS257/AB/R, adopted 17 February 2004
US – Softwood Lumber CVD Final (Panel)	Panel Report, *United States – Final Countervailing Duty Determination with Respect to Certain Softwood Lumber from Canada*, WT/DS257/R and Corr.1, adopted 17 February 2004, as modified by the Appellate Body Report, WT/DS257
US – Cotton Subsidies (Article 21.5) (AB)	Appellate Body Report, *United States – Subsidies on Upland Cotton*, WT/DS267/AB/RW, adopted 20 June 2008
US – Cotton Subsidies (AB)	Appellate Body Report, *United States - Subsidies on Upland Cotton*, WT/DS267/AB/R, adopted 21 March 2005
US – Cotton Subsidies (Panel)	Panel Report, *United States – Subsidies on Upland Cotton*, WT/DS267/R, adopted 21 March 2005, as modified by the Appellate Body Report, WT/DS267/AB/R
US– Wheat Gluten (Panel)	Panel Report, *United States – Definitive Safeguard Measures on Imports of Wheat Gluten from the European Communities*, WT/DS166/R, adopted 19 January 2001, as modified by the Appellate Body Report, WT/DS166/AB/R
US – Wool Shirts (AB)	Appellate Body Report, *United States – Measure Affecting Imports of Woven Wool Shirts and Blouses from India*, WT/DS33/AB/R and Corr.1, adopted 23 May 1997

US Comments on EC RPQ XXX	Comments of the United States on the Response of the European Communities to the First Set of Questions from the Panel to the Parties (December 21, 2007); and Comments of the United States on the Response of the European Communities to the Second Set of Questions from the Panel to the Parties (May 5, 2008)
US FWS	First Written Submission by the United States, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353)* (July 6, 2007)
US FNCOS	Oral Statement of the United States at the First Substantive Meeting of the Panel with the Parties, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353)* (September 26, 2007)
US SNCOS	Oral Statement of the United States at the Second Substantive Meeting of the Panel with the Parties, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353)* (January 16, 2008)
US RPQ XXX	Response of the United States to the First Set of Questions from the Panel to the Parties (December 5, 2007); Response of the United States to the Second Set of Questions from the Panel to the Parties (April 14, 2008); Response of the United States to the Third Set of Questions from the Panel to the Parties (July 31, 2009)
US SWS	Second Written Submission of the United States, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)(DS 353)* (Feb. 9, 2007)

I. GENERAL ISSUES

A. "BEST INFORMATION AVAILABLE"

316. How does the European Communities respond to the arguments of the United States that:

(a) "before this dispute began, the EC obtained a large volume of information regarding the challenged programs because the relevant federal, state, county, and municipal authorities provide a high degree of transparency in their dealings" and that "{w}ithin the context of this dispute, the United Sates has provided a huge volume of information that is not otherwise publicly available." (US Comments on EC RPQ 107, para. 16 and footnote 21)

1. In its response to this question, the EC concedes the obvious – that the United States has provided immense quantities of information on the challenged programs through the transparency of its institutions, through its Freedom of Information Act procedures, and through the material not otherwise publicly available that the United States submitted in this dispute. In fact, the vast majority of information before the Panel came from the U.S. government in one of these three ways.

2. The EC attempts to minimize the significance of this volume of information by repeating old arguments that the United States has already disproven. It begins by asserting that the United States has failed to provide "relevant" information because it "redacted or withheld much of the critical information in these documents."[1] As the United States has shown – by reference to the evidence – most documents have no redactions of any kind. Where there are redactions, they do not remove relevant information.[2] Thus, the EC's assertion has no validity.

3. The EC also argues again that the United States has failed to provide complete information. It does not explain what it means by this assertion, but simply cross-references

[1] EC RPQ 316(a), para. 4.

[2] The most common form of redaction is of the names and personal contact information of Boeing employees and government officials, which has no relevance to the issues before the Panel. *E.g.*, Contract NAS2-14096, pp. 1 and Attachment B, p. 4 (Exhibit US-472(HSBI)) (Name of the Boeing employee redacted; all other information, including design of aircraft, available); Letter from Cheryl Cleghorn to {NAME REDACTED} (Exhibit EC-1414) ("Regarding the names of key personnel withheld from the reports, disclosure of such information, which was submitted to the Government in confidence, would allow potential competitors to benefit from the company's efforts to build up a highly successful team which possesses unique experience and expertise in the area of aerospace research and technology. Such information is not readily available upon request by a third party."). It is worth noting that this last exhibit is one submitted by the EC, which redacted the name of the addressee of the letter, without indicating the redaction in any clear way. The United States does not question the appropriateness of such redactions. However, that the EC finds such redactions acceptable for itself, while asserting that it is evidence of noncooperation by the United States, is yet another example of its efforts to impose the "double standard of proof" – "one standard, relaxed and permissive, for the complainants, and another, very strict and demanding, for the defending party" – that the Appellate Body has condemned. *US – Cotton Subsidies (Article 21.5)*, para. 293, *quoting Korea – Alcoholic Beverages (AB)*, para. 164. The U.S. comments on EC RPQ 170(a) explain that the other redactions criticized by the EC were of information related to military technologies whose export is prohibited under U.S. law. The EC concedes that purely military technology has no relevance to this dispute. In any event, the United States provided summaries of that redacted information. US Comments on EC RPQ 170(a), paras. 283-284; US Comments on EC RPQ 190(b), paras. 325-326.

portions of previous submissions without any other explanation. To be clear, the United States has itself shown that the evidence criticized by the EC is relevant, credible, complete, and entitled to weight in the Panel's deliberations.[3]

4. The EC also questions the "transparency" of the U.S. government based on the denial of some of its requests under the Freedom of Information Act and a clerical error in which an agency neglected to forward three documents, out of hundreds requested by the EC.[4] However, a government worker's clerical error is not lack of transparency. Neither is an agency's denial of a request for information that fails to identify documents with sufficient clarity or when the requested documents do not exist or cannot be found.[5]

> *(b) the European Communities has chosen to ignore information presented by itself or by the United States, including with respect to the nature and value of NASA and DoD R&D contracts with Boeing; (US Comments on EC RPQ 109, para. 16 and footnote 22; US Comments on EC RPQ 150(a), para.181; US Comments on EC RPQ 150(b), para. 184; US Comments on EC RPQ 165, para. 262; US Comments on EC RPQ 170(a), paras. 281-282; US Comments on EC RPQ 170(b), para. 286)*

5. The U.S. statements cited in this question referred to the large number of contracts submitted to the Panel, which memorialize NASA and DoD purchases of research services from Boeing. These documents demonstrate that:

- NASA and DoD pay Boeing to supply research services to the U.S. government.[6]
- In exchange, Boeing agrees to conduct research specified by NASA or DoD in the statement of work, provide the government with the results in the form of reports

[3] US RPQ 351(a), para. 165, Exhibit US-1357(BCI); US RPQ 213, para. 341; US RPQ 170(c), paras. 287-291; US RPQ 171, paras. 292-297; US RPQ 172, paras. 298-303; US RPQ 177, paras. 174-175; and US RPQ 252, paras. 425-428. Many of the EC criticisms address documents that simply are not in the possession of the United States, such as private contracts to which the government is not a party. Others deal with information irrelevant to the Panel's deliberations, such as government contracts with companies other than Boeing, which the EC insists are not subject to its claims. EC RPQ 324, para. 41.

[4] EC RPQ 316, para. 2.

[5] These were the primary reasons agencies gave for rejecting the EC's information requests. US Comment on EC RPQ 317, *infra*. The United States notes that the implication of the EC's argument seems to be a complaining party challenging a measure by a Member with no formal provision for access to government documents would always be justified to rely on "best information available" in attempting to make a *prima facie* case. Nothing in the DSU would appear to support such an outcome.

[6] US FWS, paras. 93, 101-102; US RPQ 194, paras. 241-242; US RQ 214, paras. 347-349.

and presentations, and grant the government a license to use any inventions and data developed, including data developed in part at private expense.[7]

- NASA and DoD pay for work under contracts only when and to the extent that Boeing performs the work.[8]

- DoD contracts in most of the areas challenged by the EC had exclusively military objectives.[9] Even contracts funded through explicit dual-use programs result in technology of military value to DoD.[10]

- NASA contracts cover foundational research unrelated to any particular commercial product, but serving the government's goals, such as aviation safety, air traffic management, or advancing general aeronautics knowledge.[11]

- Agency employees were involved in the contracts to administer and manage them for the agency's benefit, and not to provide services to Boeing.[12]

- Contracts rarely provided for use of government goods by a contractor in performance of contract work, and where they did, the value of the goods was small compared to the value of the research services.[13]

- All of the DoD contracts and most of the NASA contracts in question were subject to competitive bidding,[14] which would result in the agency paying a market-determined price.

This evidence, which shows what NASA and DoD actually do in their transactions with Boeing, directly contradicts the EC arguments based on selective quoting of agency officials and generalized program descriptions. It disproves the EC allegation that the contracts exist to confer money on Boeing with no return for the government.

6. In its response to this question, the EC admits that it ignored this information, but contends that it had to do so because the contracts were "unreliable, unverifiable, and

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[7] US FWS, paras. 101-102.

[8] US FWS, para. 114.

[9] US FWS, paras. 162-164; US RPQ 208(a), para. 285; US PPQ 208(b), para. 290

[10] US FWS, para. 135.

[11] US FNCOS, paras. 57-64; US SNCOS, paras. 34-36 and 41; US RPQ 328, para. 38.

[12] US FWS, para. 179.

[13] US RPQ 336(vi), para. 63; US Comment on EC RPQ 324.

[14] US RPQ 150, paras. 130-134; US RPQ 190, para. 226, note 246.

incomplete."[15] The EC never explains why it considers that actual copies of documents containing the details of agency transactions are "unreliable" or require "verification". In fact, contract documents are fully reliable and verifiable as to their contents, as the EC plainly realized when it requested and obtained many such documents from NASA and DoD, and submitted them to the Panel.[16]

7. The EC attempts to explain its contention that the contracts are "incomplete" by arguing that the set of contracts does not cover all NASA and DoD transactions with Boeing or indicate "the value of goods and services provided in conjunction with those contracts."[17] The United States has shown that the contracts before the Panel represent 84.5 percent of the maximum value of NASA's contracts with Boeing for research covered by the EC claims.[18] In addition, the United States has explained that where goods and services are an important part of a transaction, they *are* referenced in the contract documents, as in Contract NAS 1-20546, which the United States discussed in its response to Question 336(vi).[19]

8. But, more importantly, the EC's contentions about the completeness of the contract set and the information on goods and services do not lessen the weight or credibility of the contract documents as evidence of how NASA and DoD structure their transactions. As the United States has explained, that evidence demonstrates the fallacy of the EC arguments that the transactions were grants, and on terms more favorable than the market would provide. The EC decision to ignore the contracts, whatever the reason, leaves them as unrebutted evidence of what NASA and DoD actually do – namely, enter into transactions in which a contractor supplies research services and intellectual property rights in exchange for money and other valuable compensation specified in the contract. The EC has provided absolutely no evidence that these transactions provided Boeing more remuneration than was adequate. Thus, the EC has failed to meet its burden of proof with regard to the existence of a financial contribution and benefit.

> *(c) there is ample evidence in front of the European Communities to enable a "bottom-up" analysis of the NASA and DoD measures at issue (E.g., US RPQ 6, para.6; US Comments on EC RPQ 148, para. 156)?*

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[15] EC RPQ 316(b), para. 5.

[16] Summary of Denials to Requests for Government Information (Exhibit EC-28) (actually showing extensive grants of EC requests for information); EC RPQ 316(a), para. 1 ("The European Communities was able to obtain a substantial amount of information regarding the challenged subsidy programmes through publicly available channels, namely Freedom of Information Act ("FOIA") and similar state and local requests."); *e.g.*, Contract NAS1-18862 (Exhibit EC-331); Contract NAS1-20553 (Exhibit EC-334); Contract NAS1-20220 (Exhibit EC-347); SAA 249 (Exhibit EC-345); SAA 404 (Exhibit EC-346); Contract F33615-91-C-5716 (Exhibit EC-507); Contract F33615-91-C-5720 (Exhibit EC-508); Agreement F33615-95-2-5019 (Exhibit EC-512); and Agreement F33615-96-2-5051 (Exhibit EC-513).

[17] EC RPQ 316(b), para. 6.

[18] US RPQ 188, para. 225.

[19] US RPQ 336(vi), para. 63.

9. The EC asserts that the available evidence did not allow an accurate valuation of all of the NASA or DoD contracts with Boeing and the alleged provisions of goods.[20] As an initial matter, the same criticism applies with even greater force to the "top down" approach favored by the EC, which assumed that anything not exclusively related to engines or air traffic management was related entirely to civil aircraft. This approach guaranteed that any research covering multiple topics was attributed exclusively to civil aircraft, and treated as if it had no relationship to anything else.[21] This is scarcely the "best information available," and has the obvious tendency to inflate artificially the value of research attributed to the industry producing civil aircraft and parts.

10. Moreover, the publicly available evidence uniformly indicated that NASA's payments to Boeing were dramatically lower than the EC alleges. Indeed, evidence available to the EC from the outset of this proceeding proved that its methodology greatly overstated any payments or provisions of goods and services to Boeing.[22] The most glaring example comes from the High Speed Research ("HSR") Program, in which detailed information on NASA's spending plans made clear that the EC had overestimated both the combined value of contract payments to Boeing and any goods or services involved in the program.[23] That information should have provoked even *greater* concerns with respect to the other challenged NASA programs.[24] This same information would have allowed the EC to devise more reasonable estimates had it chosen to do so.

11. The contracts and other information provided by the United States over the course of this dispute offered yet another way to avoid the obvious and glaring inaccuracies of the EC's favored "top down" approach. The U.S. response to Question 352 suggests a way to perform a calculation based on this evidence.[25]

12. Of course one noteworthy difference between the fact-based analyses submitted by the United States and the EC's "top down" approach, based on assumptions and selective quotations, is that the fact-based estimates all yield results far lower than the "top down" approach.

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[20] EC RPQ 316(c), para. 7.

[21] EC RPQ 335, para. 80. The U.S. comments on the EC response to Question 335 and its parts elaborates on this point.

[22] For example, NASA's overall procurement data showed that Boeing accounted for 17 percent of total NASA payments under research contracts, evidence that contracts with Boeing did not account for the huge percentage of NASA spending – under contracts or otherwise – asserted by the EC. US SWS, para. 74. *See also* US Comment on EC RPQ 2, paras. 4-5; US Comment on EC RPQ 166, paras. 263-267; US SNCOS, paras. 22-25 and Exhibit US-1252; US Comments on EC RPQ 202, paras. 365-369.

[23] US Comment on EC RPQ 166, paras. 236-267; US RPQ 344, para. 145.

[24] US Comment on EC RPQ 166, para. 267.

[25] US RPQ 352, paras. 168-174.

317. How did the European Communities obtain the copies of the NASA and DoD R&D contracts and agreements that it has provided to the Panel?

13. The EC admits that it received most of the information on which it relies directly from U.S. government agencies, or from information otherwise made publicly available by the U.S. government.[26] It once again accuses the United States of withholding information, and characterizes the contract information as incomplete. However, as the United States explains above in its comments on the EC response to parts (a) and (b) of Question 316, the contract set covers the large majority of NASA's payments to Boeing under contracts for aeronautics research challenged by the EC. The EC also complains that agencies rejected some of its requests for information under the U.S. Freedom of Information Act.[27] However, the EC's summary of its efforts to obtain information indicates that the most frequent reasons for denial were that the EC's requests were too broad to identify responsive documents or that the requested documents did not exist or could not be found.[28] Thus, the agencies did all that they could by releasing the documents they could identify, to the extent the documents were releasable.

14. The EC also notes that the contracts submitted to the Panel do not account for all of the funds in NASA's aeronautics program budgets. As the United States has explained, most of the funds covered payments to entities other than Boeing.[29] As the EC insists that its claims do not extend to payments to other contractors,[30] it is difficult to understand why this comment is relevant to the Panel's deliberations.

B. TERMS OF REFERENCE

318. The United States argues that the terms of reference of this Panel do not cover:

(a) the provision of "equipment and employees" by DoD (US Comments on EC RPQ 156, para 216; US Comments on EC RPQ 189, para. 313);

(b) funding under the NASA R&D programmes at issue to entities outside the large civil aircraft industry (US Comments on EC RPQ 163(d), paras. 234-235);

(c) any payments that Boeing received under sub-contracts (US Comments on EC RPQ 3(b), paras. 19-21).

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[26] EC RPQ 317, para. 9.

[27] EC RPQ 317, para. 9.

[28] *Summary of Denials to Requests for Government Information* (Exhibit EC-28)

[29] US RQ 175, para. 159.

[30] EC RPQ 324, para. 41.

Could the European Communities explain in detail why it considers that these issues are within the Panel's terms of reference?

15. The EC response to this question confirms that its claims do not extend to payments to entities outside the large civil aircraft industry. Nevertheless, the EC contends that it can bring the claims identified in the question within the Panel's terms of reference merely by asserting that the payments resulted in goods and services that NASA then supplied to Boeing. As the United States has explained, with the exception of a limited number of Space Act Agreements, NASA does not provide goods and services to any of its contractors within the meaning of Article 1.1(a)(1)(iii).[31] Moreover, the EC has provided no evidence that such transfers occurred, or that any goods or services related to the NASA transactions involved the huge dollar values that the EC alleges.

16. The EC concedes that the terms of reference of this Panel do not specifically mention DoD equipment and employees or subcontracts. However, it argues that its panel request covers such claims in the form of allegations that NASA and DoD "transfer{} economic resources" to the U.S. large civil aircraft industry.[32] Nothing in the EC's request would lead the responding party or third parties to understand that the EC intended the term "transfers" of financial resources to include DoD equipment and employees or subcontracts in this dispute. Relying on a broad catch-all phrase like "transfer of economic resources" to encompass any claim a party may devise over the course of a proceeding would reduce the panel request to a meaningless formality. As the Appellate Body explained with regard to a similar effort:

> the convenient phrase, "including but not necessarily limited to", is simply not adequate to "identify the specific measures at issue and provide a brief summary of the legal basis of the complaint sufficient to present the problem clearly" as required by Article 6.2 of the DSU. If this phrase incorporates Article 63, what article of the TRIPS Agreement does it not incorporate?[33]

Similarly, if "transfer of economic resources" covers DoD equipment and employees not mentioned in the panel request, or Boeing subcontracts with entities that the request does not mention, which of the many thousands of transactions conducted by NASA and DoD does it not cover?

17. Moreover, the EC is wrong to assert that its catch-all phrase encompasses subcontracts. Specifically, the panel request alleges only that "NASA . . . transfers economic resources" and "DoD . . . transfers economic resources." As the United States has explained, subcontracts are not a "transfer" of anything by the contracting agency. A subcontract exists because of a

[31] US FNCOS, paras. 65-66; US SNCOS, paras. 27-32 and 54-55; US RPQ 186, paras. 206-208; and US Comment on EC RPQ 156, para. 214.

[32] EC RQ 318, paras. 11 and 13.

[33] *India – Patent Protection (AB)*, para. 90.

decision *by the prime contractor* to pay another entity to perform some of the work that the prime contractor has promised to undertake for the agency. The prime contractor defines the scope of the work and makes all payments.[34] Thus, under a subcontract, DoD or NASA does not "transfer" anything to anyone.

18. The EC makes an even less plausible argument that subcontracts fall within its allegation that NASA and DoD "allow{} the US LCA industry to participate in" research. Again, the decision to subcontract is not a matter of NASA or DoD allowing a particular entity or industry to "participate" in government-funded research. It is a separate contractual decision by two private parties. While agencies do have a limited right to "consent" to a contractor's choice of subcontractors in certain circumstances, those circumstances rarely exist for a major contractor like Boeing.[35] Nor would "allowing" a transaction be a financial contribution. If that were the case, every decision by a government not to ban some economic activity would be a financial contribution, a result that would reduce Article 1.1(a) of the SCM Agreement to a nullity.

19. Aside from the fact that the phrase "transfer economic resources" does not cover the "transfers" discussed in this question, the EC's claim would still fail. Article 6.2 of the DSU requires that a request for establishment of a panel "identify the specific measures at issue and provide a brief summary of the legal basis of the complaint sufficient to present the problem clearly." The EC's catch-all phrase provides no such clarity. It does not indicate what "resources" it covers, how the transfer occurred, or, in the case of subcontracts, what entity is doing the transferring.

II. SUBSIDY PROGRAMMES

319. Regarding the allocation of "data rights" under NASA and DOD procurement contracts, please indicate whether the Panel is correct in its understanding that:

*(a) contractors (e.g. Boeing) are "allowed to retain ownership of the technical data and computer software it developed; and the Government receives only a license to use that technical data and computer software" (*Intellectual Property: Navigating Through Commercial Waters, Issues and Solutions When Negotiating Intellectual Property With Commercial Companies*, Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, 15 October 2001 (EC-557)), at 1-3, 1-4);*

20. The EC does not answer the question posed by the Panel, but asserts, without explanation or citation, that it "understands there are additional ways in which NASA and DoD have been able to transfer ownership of valuable data rights and computer software to the US LCA

[34] US RPQ 3(b), paras. 21-26; US RPQ 130, paras. 889-94.

[35] US Comment on EC RPQ 3(b), para. 30; US Comment on EC RPQ 132(iii), para. 100.

industry."[36] The United States is aware of no such "additional ways," but if the EC believed otherwise, it had the responsibility to identify and provide evidence about them.

21. The EC contends that NASA and DoD practices regarding data rights mean that Airbus "cannot – and did not – benefit from US Government R&D reports."[37] As support for this proposition, it cites a series of U.S. submissions that actually demonstrate the opposite – that the results of NASA research are available to everyone.[38] Similarly, the EC cites a statement by four Airbus engineers that, by extensively referencing the results of NASA research, testifies to the ease and comprehensiveness of their access to those results.[39] The same Airbus engineers admit that NASA research has a "generic and academic value" to Airbus.[40] Their complaint appears to be that Boeing uses the results of NASA research to build its aircraft, while Airbus cannot. Boeing engineers, who are better placed to know, have stated plainly that they are in the same position as the Airbus engineers. They find NASA research to be of little commercial usefulness because it is "focused on a very early stage of technology development" and "{a}s a result, it does not impact Boeing's product development or provide Boeing with any competitive advantage."[41]

> *(b) the US government permits contractors (e.g. Boeing) to retain rights to software and other technical data in order "to assist in the transfer of {Federally funded}*

[36] EC RPQ 319(a), para. 16.

[37] EC RPQ 319(a), para. 17.

[38] US FWS, paras. 932, 947, and 974; Statement of Michael Bair, paras. 6, 33, and 37 (Exhibit US-7). The EC also cites to two nonexistent paragraphs of the U.S. second written submission. The EC may have intended to refer to paragraphs 829 and 830 of its own second written submission. The argument in those paragraphs refers to the statement of the four Airbus engineers, which the United States addresses in its comment on this question. The EC second written submission also cites a United Kingdom government official, Ray Kingcombe, as saying that NASA reports "do not contain critical research results." EC SWS, para. 829. However, the text of his statement indicates that he was referring to difficulties he had with two NASA reports on engine research published in the 1970s. Statement of Ray Kingcombe, p. 1 (Exhibit EC-1177) ("we tried on a number of occasions between 1976 and 1978 to access some NASA reports"). This evidence of Mr. Kingcombe's individual experience three decades ago is entitled to no weight against the evidence that scientists all over the world, including in Europe, frequently cited articles by NASA researchers and NASA contractor reports produced between 1989 and 2006 under the programs challenged by the EC. *Reports and articles published by Boeing/McDonnell personnel pursuant to aeronautics research contracts*, (Exhibit US-1253). The EC also argues that dissemination restrictions applicable to a limited set of data generated in a limited number of contracts under three of the challenged programs withheld access from NASA data. EC SWS, para. 830. The United States has demonstrated that such restrictions were temporary and are no longer in effect. US FWS, para. 352; US RPQ 23, paras. 73-76. Moreover, even the programs to which the restrictions applied generate large volumes of nonrestricted information that was cited in scientific publications in the United States and Europe. *List of publications based on work performed in the Integrated Wing Design (IWD) Project* (Exhibit US-1140(revised)).

[39] Statement by Patrick Gavin, *et al.*, paras. 11-14 (exhibit EC-1175) (HSBI).

[40] Statement by Patrick Gavin, Tim Sommer, Burkhard Domke, and Dominik Wacht, para. 72 (Exhibit EC-1175).

[41] Statement of Michael Bair, para. 33 (Exhibit US-7).

> *technology to the marketplace" (1987 Executive Order entitled "Facilitating access to science and technology" (EC-561), at s. 1(a) and 1(b)(6)).*

22. The U.S. response to this question explained that the quoted text is simply one element of U.S. government policy regarding rights in technical data and software. Other aspects of the law, regulations, and policy ensure that the government obtains the rights that it needs for the lowest price – a quintessential market-driven objective.

23. As is unfortunately so often the case, the EC builds an argument on a selective and limited set of quotations, and asserts that the only reason for the attribution of data rights under government contracts is "to allow the US LCA industry to benefit from those rights in the commercial marketplace."[42] First, the EC ignores agency practice and the other provisions of U.S. law recognizing that suppliers' ability to use data developed under government contracts is one of the incentives that make them willing to work for the government, and enables the government to obtain the data and software it needs at the lowest possible acquisition cost.[43] The EC also ignores that all contractors with NASA or DoD, including those outside the large civil aircraft industry, receive the same intellectual property attribution provisions as under those agencies' contracts with Boeing. Indeed, the same substantive rights apply to contractors with all other U.S. government agencies.[44]

24. The EC's arguments also disregard the economic reality of the government's purchases of research services from private suppliers. The contractor brings its own valuable knowledge, experience, and intellectual property to the transaction. The government is not in a position to dictate terms. If it were to insist on taking all rights related to work done under the contract, which seems to be the position advocated by the EC, the supplier would risk losing the commercial use of the results of its self-funded investment. As the DoD intellectual property rights negotiating handbook indicates, qualified contractors may refuse to work with the government under such conditions.[45] To gain access to their expertise and save money by leveraging investments that contractors made with their own funds, government intellectual property contracting policy seeks to "strike a balance between the Government's need and the contractor's legitimate proprietary interest."[46]

25. The EC's argument also errs in treating data and software rights as a binary, zero-sum game where one side must take everything and the other receive nothing. As is typical in the market, the government and its suppliers generally enter into a contract because they conclude that it offers both sides a "win-win" situation. The government gets the data rights or software it

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[42] EC RPQ 319(b), para. 18.

[43] US RPQ 319(b), para. 9.

[44] US FWS, paras. 313-325.

[45] US RPQ 319(b), para. 9.

[46] 48 CFR § 27.402 (Exhibit US-147).

needs at the best price, while the contractor gets monetary compensation and data rights that may have further commercial applicability. The EC correctly notes that sometimes agency officials publicize their suppliers' "wins" with regard to data rights when they testify before Congress or make statements to the press.[47] By the same token, private companies often publicize the public benefits of a particular product or a plant location decision. These statements are a form of public relations, and do not change the underlying commercial nature of the transactions.

26. Finally, the EC refers to the limited exclusive rights data ("LERD") clause under some of the contracts funded through the ACT, HSR, and AST Programs,[48] which diverged from the standard intellectual property clause referenced in the Panel's questions. These clauses are an example of a situation in which the government varied the terms of intellectual property rights so as to maximize the amount of information it received for the acquisition price it was able to pay. The U.S. comment below on the EC response to Question 325 discusses this issue in greater detail.

320. Both parties have argued that "the terms of a commercial transaction in which one entity pays another entity to conduct R&D" should serve as a market benchmark against which the terms of any financial contributions provided to Boeing under NASA/DoD R&D programmes could be compared for the purpose of determining whether those financial contributions conferred a "benefit" within the meaning of Article 1.1(b) of the SCM Agreement (EC RPQ 21; US RPQ 136(a)). Do the parties consider that what constitutes an appropriate market benchmark for purposes of considering whether contractual provisions on intellectual property rights confer a benefit may depend upon factors such as the type of R&D (e.g. "basic" vs. "applied" research), the economic sector involved (e.g. civil aeronautics vs. medical research), and/or the circumstances of the parties to the transaction (e.g. a manufacturer vs. a university or other scientific research establishment)?

27. As the Appellate Body has stated, a benefit exists for purposes of Article 1.1(b) of the SCM Agreement if a recipient has received a financial contribution on terms more favorable than those available to the recipient in the market.[49] In its opening remarks, the EC incorrectly frames the benefit question as whether "one entity would pay another entity to perform R&D for the purpose of helping the entity that receives the funding, and then transfer/waive the resulting intellectual property rights to the entity receiving the funds."[50] The alleged motive or "purpose" of a government for providing a financial contribution is not an element of the financial

[47] *E.g.*, EC RPQ 317(b), para. 21.

[48] EC RPQ 319(b), para. 19.

[49] *Canada – Aircraft (AB)*, para. 157-158. Article 14 of the SCM Agreement also provides guidance that informs the methodology for determining the existence of a benefit.

[50] EC RPQ 320, para. 22. The United States also discussed the irrelevance of "government purpose" in its Comments on EC PRQ 216, para 385.

contribution itself, which Article 1.1(a) of the SCM Agreement defines in objective terms, according to the nature of the transaction. The motive or "purpose" is also not one of the terms of the financial contribution that are compared with the "terms" available in the market to assess the existence of a benefit.[51] In sum, Article 1.1(b) requires an inquiry into whether the objective terms on which the government provides a financial contribution are more favorable than available in the market, and does not look behind those terms to evaluate motivation. Indeed, even in situations where a government provided a financial contribution for the purpose of "supporting and developing . . . export trade," panels found that the contributions did not confer a benefit on their recipients as long as their terms were not better than terms available on the market.[52]

28. Thus, under SCM Agreement Article 1.1(b), the fundamental question is whether NASA paid Boeing to perform research services on terms more favorable than those available in the market. Contracts A, B, C, and D,[53] which reflect Boeing's purchases of research services, demonstrate that the terms of the NASA-Boeing transactions challenged by the EC are indeed available in the market. Specifically, there are market transactions in which the purchaser pays for the performance of research services and a license to use any data or patented inventions developed under the contract, while leaving ownership of data rights and any patents to the supplier.

29. The Panel asked the parties to address whether several factors would affect the appropriateness of a benchmark: the type of R&D procured, the economic sector in which the transaction occurs, and the profit or not-for-profit status of the parties to the transaction. The EC nowhere suggests that the type of research or the sector covered by Contracts A, B, C, and D limits their usefulness as benchmarks. It does, however, raise spurious concerns about the fact that the service providers in these transactions are not-for-profit entities.[54]

30. The United States disagrees that the not-for-profit status of the R&D service providers renders these contracts invalid as benchmarks against which to compare NASA's purchases of research services from Boeing. Under Article 1.1(b) of the SCM Agreement, the question is whether relevant terms are available in the market. Panels and the Appellate Body have found

[51] If the government motive were a factor, it would be difficult to find commercial benchmarks, as governmental objectives, such as the public good, national defense, universal free education, etc., are seldom motives for transactions between for-profit entities.

[52] *E.g.*, *Canada – Aircraft (Panel)*, paras. 9.127, 9.160-9.174.

[53] Exhibits US-1208(BCI) through US-1211(BCI) and Exhibits US-1342(BCI) and US-1343(BCI), respectively.

[54] The EC also complains that the contracts are "highly redacted". EC RPQ 320, para. 26. However, the only information redacted from these contracts is the names of the universities themselves, which is done in respect of the "use of names" provisions in each contract. *E.g.*, Contract A, art. 9 (Exhibit US-1208(BCI)).

that the market from which the benchmarks are taken must be commercial.[55] However, they have not suggested that both parties must have for-profit corporate status. Universities are independent operators that participate actively in commercial markets in furtherance of their not-for-profit objectives. And the particular contracts that the United States provided as benchmarks demonstrate that universities unrelated to Boeing negotiate these transactions in a self-interested manner, as demonstrated by their demand for full payment for their services and retention of intellectual property rights. Thus, to the extent these universities receive payments from for-profit entities on the same terms that U.S. government contractors receive payment from the government, it demonstrates that the government terms are not "more favourable than those available in the market" and, therefore, conferred no benefit within the meaning of Article 1.1(b).[56]

31. The EC never clarifies why the not-for-profit status of the supplier undermines the suitability of these transactions as benchmarks. In Contracts A, B, C, and D, Boeing stands in a comparable position to NASA as the purchaser, and thus demonstrates that a "for-profit" entity does indeed enter into R&D transactions on the same terms that NASA does. The EC attempts to avoid this logic by asserting that "the relationship between Boeing and universities is often one in which the university is a beneficiary of charitable donations, or a recipient of Boeing's budget for recruiting future employees."[57] That may sometimes be the case, although there is no evidence to suggest that it occurs "often," but the contracts that the United States proposes as benchmarks are not agreements to provide charitable contributions or take on student interns. To the contrary, Boeing contracts to pay for research services on a project that it defines, and also secures rights in the intellectual property developed in the course of performing the research.[58] The contracts contain no indication of charitable intent – to the contrary, they specifically memorialize the terms on which the two parties "will do business" with each other.[59] As such, they are appropriate benchmarks.

32. Although the United States considers that the university contracts are appropriate, comparable market benchmarks for the challenged NASA transactions, it took note of the Panel's request for benchmarks between two for-profit entities. Accordingly, it also provided examples of two such contracts that demonstrate, just as the university contracts do, that the terms on which NASA contracts with Boeing are terms available in the marketplace.[60]

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[55] *E.g.*, *Brazil – Aircraft (Article 21.5 II) (Panel)*, para. 5.29 ("We consider it evident that the 'market' to which reference must be made is the commercial market, that is, a market undistorted by government intervention.") and *US – Softwood Lumber CVD Final (AB)*, para. 90-91.

[56] *Canada – Aircraft (AB)*, para. 157.

[57] EC RPQ 320, para.

[58] See Exhibits US-1208(BCI), US-1209(BCI), US-1210(BCI), and US-1211(BCI).

[59] *E.g.*, Contract A (Exhibit US-1208)(BCI) ([***]) (emphasis added).

[60] See Exhibits US-1342(BCI) and US-1343(BCI).

33. The other consideration that the EC identifies as relevant is bargaining power, which it sees NASA and DoD as possessing. However, the EC fails to provide legal or factual support for this position.

34. As a legal matter, the EC also fails to explain why such considerations would be relevant to selection of a benchmark for comparison with a financial contribution. They are not. The Appellate Body has explained that:

> the word "benefit", as used in Article 1.1(b), implies some kind of comparison. This must be so, for there can be no "benefit" to the recipient unless the "financial contribution" makes the recipient "better off" than it would otherwise have been, absent that contribution. In our view, the marketplace provides an appropriate basis for comparison in determining whether a "benefit" has been "conferred".[61]

The degree of governmental bargaining power has no effect on the terms the *recipient* would receive from *another purchaser* in the market. Thus, it is not a relevant consideration in evaluating the existence of a benefit.

35. On the factual side, the EC provides no evidence that NASA or DoD has "tremendous bargaining power." It simply assumes that this is so based on its assertion, again without any citation to evidence,[62] that "there is no other entity that directs such large amounts of R&D funds to aerospace companies on a regular basis."[63] Even if the Panel were to accept the EC's unproven assertion that NASA and DoD spend more on research than commercial entities, that does not support the conclusion that they have bargaining power. As a logical matter, purchasing power does not translate into bargaining power unless the seller wants to do business with the purchaser and does not control something that the purchaser needs. For example, if the seller has other business opportunities, it can simply reject the purchaser's terms and focus on other purchasers. Similarly, if the seller has something that the purchaser needs, the seller has bargaining power, too, regardless of any disparity in their size. The seller may even have more bargaining power if the purchaser's need is great. The EC has not shown that NASA and DoD research budgets give them the kind of bargaining power that would allow them to obtain better terms than are available on the market for other purchasers.

36. Outside of the theoretical discussion, several considerations limit any bargaining power NASA or DoD could have. The multitude of contracting regulations and accounting obligations impose a high cost on entities that do business with the U.S. government. In addition, the U.S. government obtains the right to use the results of contracted research for any purposes, and may disseminate the results openly, including to competitors, or convey them to another contractor

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[61] *Canada – Aircraft (AB)*, para. 157.

[62] As support for this proposition, the EC cites paragraph 551 of its second written submission, which itself contains only an assertion with no supporting evidence. *See* EC SWS, para. 551.

[63] EC RPQ 320, para. 23.

for use in performing work for the government. If DoD demands too much from its suppliers of data or software, it finds that they refuse to do business with it.[64] Thus, the size of a government agency's procurement budget does not equate with bargaining power. To the contrary, the facts suggest otherwise, particularly where the government is bargaining with an entity like Boeing, which has a strong non-government contracting business and unrestrained access to capital to fund its own R&D on projects of its own choosing.[65]

37. In closing, the EC has asserted that Airbus will only conclude transactions that allow it to obtain ownership rights of all intellectual property whose development it funds, and that any different practice by U.S. government entities is inconsistent with terms available in the market.[66] The benchmark contracts provided by the United States demonstrate, however, that at least one for-profit entity is willing to vary its intellectual property terms from transaction to transaction. Its flexibility extends to the purchase of research services on terms that allow it to use, but not to own, the intellectual property generated in the course performing the research that it funds.[67] Thus, Contracts A, B, C, D, E, and F demonstrate that NASA purchases research services from Boeing on terms that are available in the market. To the extent that the purchase of services can be considered a financial contribution within the meaning of Article 1.1(a) of the SCM Agreement, the NASA and DoD transactions confer no benefit within the meaning of Article 1.1(b).

321. Is the Panel correct in its understanding that some of the DoD RDT&E project elements at issue were funded through cooperative agreements or other "assistance" instruments, whereas others were funded through procurement contracts? If so, please clarify which project elements were funded through cooperative agreements or other "assistance" instruments, and which project elements were funded through procurement contracts.

38. The United States has no comment on the EC's statement that PE numbers do not relate to particular types of instruments.

39. In addition to answering this question, the EC asserts that its claims relate to DoD's RDT&E budget as a whole.[68] As the United States explained in its response to Question 361 and below its comments on the EC response to Question 359, the EC's claims cover only funding under the 23 PE numbers enumerated in the request for establishment of this Panel. If the EC does interpret the scope of its panel request as being broader, the request would be inconsistent with Article 6.2 of the DSU because it fails to "identify the specific measures at issue and

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[64] *Intellectual Property: Navigating Through Commercial Waters*, p. 3-3 (Oct. 15, 2001) (Exhibit EC-557).

[65] *E.g.*, USFWS, paras. 832-839 and Statement of Bruce Greenwald, p. 1-2 (Exhibit US-8).

[66] Exhibit EC-1178.

[67] Contracts E and F (Exhibits US-1342(BCI) and US-1343(BCI)).

[68] EC RPQ, para. 30.

provide a brief summary of the legal basis of the complaint sufficient to present the problem clearly."[69]

322. Please explain whether "a government provides goods or services other than general infrastructure" within the meaning of Article 1.1(a)(1)(iii) of the SCM Agreement when the government provides access to results of research performed by a government agency or when it provides access to results of research funded by the government and performed by non-governmental entities, and, if so, how the existence of a benefit within the meaning of Article 1.1(b) of the SCM Agreement should be determined.

40. The EC failed to respond to the question asked by the Panel, as it does not "explain" any of the assertions it makes. With respect to the financial contribution question, it simply declares without any elaboration that "research results are not general infrastructure."[70] This statement is not only without support, it is also incorrect. Research results are no different from any other generally available publication, including books and scientific journals.[71] They are precisely the kinds of materials that would constitute a library, something both the United States and the EC agree is a form of general infrastructure.[72] Thus, when NASA provides entities access to its research results through its on-line and physical libraries, it is providing "general infrastructure."

41. With respect to the question of benefit, which is irrelevant when the financial contribution is general infrastructure, the EC asserts that, in the market, research results are not available for free. This is correct, just as it is for other types of general infrastructure. (For example, private roads and bridges may charge tolls.) However, the United States has demonstrated that in the market, entities publish research results comparable to those that NASA makes freely available, and that these entities charge a minimal cost for paper copies[73] in comparison with the amounts alleged by the EC.

42. The EC also states that, to the extent "access to research" includes the provision of intellectual property rights, it could be considered the provision of goods or the foregoing of government revenue. The United States has explained that intellectual property rights are not "goods" within the meaning of Article 1.1(a)(1)(iii) of the SCM Agreement.[74] More importantly, the access to research results challenged by the EC does not "provide" intellectual

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[69] US RPQ 361, paras. 182-189.

[70] EC RPQ 322, para. 31.

[71] *E.g., List of the Current Subscription Price of Journals to which the Boeing Company Subscribes* (Exhibit US-1333).

[72] US FWS, para. 47.

[73] *List of the Current Subscription Price of Journals to which the Boeing Company Subscribes* (Exhibit US-1333).

[74] US RPQ127(a), paras. 53-56.

property rights to contractors – it merely gives them the same rights as the general public to see what NASA contractors and NASA's own scientists have done.

323. At paragraph 11 of its Closing Statement at the Second Meeting, the European Communities indicated that "{i}f the Panel desires to see further examples of the treatment of IP when one for-profit entity purchases R&D services from another for-profit entity, the European Communities is prepared to provide them upon request." The Panel hereby requests that the European Communities provide these further examples.

43. The EC's response to this question repeats the opening remarks it made in response to Question 320. This repetition makes clear that the EC has only one basis for arguing that NASA and DoD research contracts contain terms more favorable than are available in the market. That is its assertion that "entities in the commercial marketplace do not fund the R&D of other entities (for the purpose of aiding those entities), and then give up what may be the most valuable part of the work product: the intellectual property rights."[75] As a legal matter, the purpose of a government transaction has no relevance in evaluating whether it is a financial contribution or confers a benefit within the meaning of Article 1 of the SCM Agreement.[76] As a factual matter, entities in the market do fund research conducted by other entities – that is, they purchase their research services – without obtaining full ownership rights in the intellectual property developed under the contract.[77] With the law and the facts against it, the EC fails in its claim that NASA and DoD contracts provide terms more favorable than are available in the market.

44. This iteration of the EC's flawed argument exposes its flawed premise with particular clarity. The EC states that "market-based actors ensure that they retain the IP rights resulting from the R&D they fund. Otherwise, they have no way to receive a full return on their investment."[78] Yet, the "IP rights" that will enable a market-based investor to achieve a "full return" on its investment do not necessarily have to capture *all* potential rights. Entities purchase research for different reasons, and may have different plans to use the results. They also recognize that a service supplier permitted to retain ownership of its inventions and data will likely demand a lower payment for its services. Therefore, a market-based investor may be able to achieve a full return for its purposes by securing only a license to use the results of the research services that it purchases. Contracts A, B, C, D, E, and F, which the United States submitted, demonstrate that Boeing is a commercial entity that does just that. There is, accordingly, no basis to conclude that NASA and DoD act in a non-commercial manner when they allow their suppliers of research services to retain some of the intellectual property rights generated under their contracts.

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[75] EC RPQ 323, para. 33.

[76] See US comments on EC RPQ 320, supra.

[77] See US comments on EC RPQ 320, supra, and Contracts A-F (Exhibits US-1208-1211, 1342-1343 (BCI)).

[78] EC RPQ 323, para. 33.

45. With respect to the Dieu Declaration[79] and the four additional contracts provided by the EC in its response to the Panel's question, the United States acknowledges, as it always has, that there are market transactions in which the entity that purchases research services obtains ownership of all intellectual property rights arising from the performance of those services.[80] But the United States has also demonstrated that the market does not dictate a single outcome in the negotiation of intellectual property rights. There is diversity in the disposition of rights, and in some market transactions, including Contracts A, B, C, D, E, and F, the purchasing entity obtains only a license to use the intellectual property made in the course of performing research services.

46. Thus, the evidence provided by the EC does not change the answer to the benefit question in this case. Assuming, *arguendo*, that NASA's purchases of research services constitute a financial contribution, was that contribution made on terms more favorable than terms available in the marketplace? The answer is no. Therefore, the transactions confer no benefit, and no subsidy exists.

324. How does the European Communities respond to the arguments of the United States (US Comments on EC RPQ 163(d), paras. 236-242) that the European Communities has failed to substantiate its assertion that funding to entities outside the civil aircraft industry constitutes a subsidy to Boeing?

47. The EC begins by denying that it treats funding to entities outside the civil aircraft industry as a benefit to Boeing. However, it quickly moves on to defend its methodology that does just that – treat the value of such funding (among other things) as a benefit to Boeing –

[79] The United States notes that the EC presents the Dieu Declaration without submitting the contracts memorializing the transactions that it discusses. The EC expects the Panel to accept Ms. Dieu's statements as accurate reflections of the aspects of Airbus' research purchasing practices that she describes. This is another example of the asymmetric burden of proof that the EC seeks to apply to this dispute, as it insists that the Panel should disbelieve statements of U.S. officials, as reflected in the U.S. submissions, absent vast quantities of supporting evidence. To be clear, the United States is not suggesting that copies of Airbus research contracts are necessary for the Panel to reach a conclusion. However, it should accord at least as much weight to U.S. government officials' views, as reflected in the submissions of the U.S. government, as it affords to the views of Airbus employees submitted in the form of declarations.

[80] All of the contracts submitted by the EC are "development" contracts under which the supplier agrees to develop a commercial product for the purchaser. *E.g.*, Contract between SPACEHAB, In. and RSC-Energia (Jan. 31, 1998) (Exhibit EC-1415) (supplier agrees to design, develop, manufacture, test, and deliver an unpressurized cargo pallet); Contract between Thermage, Inc., and Stellartech Research Corporation (Exhibit EC-1416) (supplier agrees to design, construct, comprehensively test prototypes, clinical units, and commercially available skin treatment devices); Development Agreement between Cox Interative Media, Inc., and LookSmart, Ltd. (Exhibit EC-1417) (supplier agrees to create and develop databases and ontologies to be made available to website users); and Development Agreement between Applied Analytical Industries, Inc., and Genest, Inc. (Exhibit EC-1418) (supplier agrees to formulate, test, produce for clinical trials, and obtain regulatory approval of a hormone pharmaceutical product). These examples differ significantly from the services in foundational research that NASA purchases.

based on the assertion that NASA "acquired" goods and services from entities other than Boeing, and "subsequently provided {them} to Boeing."[81]

48. As the United States has shown, the value of payments to Boeing for the research challenged by the EC was at most $775 million.[82] The EC asserts that the $9.6 billion remainder of its $10.4 billion allegation of NASA "funding" of Boeing represents the value of "goods and services" provided to Boeing.[83] To be sure, there is absolutely no evidence that NASA arranged any transfer of goods and services to Boeing, let alone the massive transfer alleged by the EC. The only goods or services provided were under Space Act Agreements, worth only $75 million, and subject to a requirement that the recipient provide equivalent contributions to NASA. Facilities and equipment were made available to perform work under contracts only rarely, and were involved only to facilitate completion of the work required by the agency. The only services involved were to ensure that the contracts produced the results sought by NASA. Moreover, the value of any goods was small. Even when a contract included unusually valuable equipment, the value of all goods available was small in comparison to the value of the payments for services under the contract.[84]

49. The EC does not even pretend that the actual evidence shows the transfer of goods and services of such a magnitude to Boeing. Instead, it defends treating NASA transactions with other contractors as a benefit to Boeing by asserting that:

> it was reasonable to infer, based on the facts available and the absence of concrete evidence to the contrary that such funding to outside entities was undertaken in order to bring about LCA-related technologies and provide the resulting goods and services to Boeing.[85]

These "facts available," on which the EC bases its inference, were the "stated purposes" of the NASA programs (as recounted by the EC) and a series of other incorrect and unsupported assertions that the United States addresses in its comment on the EC response to Question 377.

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[81] EC RPQ 324, para. 44.

[82] US RPQ 175, para. 160.

[83] EC RPQ 324, para. 43; Exhibit EC-25, p. 1.

[84] US RPQ 336(vi), para. 63; *List of Government-furnished property under Contract NAS1-20546 (*Exhibit US-1334). As the United States has explained, NASA does not maintain comprehensive historical records of goods made available under its contracts. However, Contract 1-20546 involved unusually valuable equipment – so valuable that the EC highlighted that contract in its arguments. The contracting officer entered all goods in minute detail in the contract modification documents, reporting a total value of equipment equivalent to 15 percent of the total payments under the contract. This evidence gives the Panel insight into the relative value of research services and equipment in an equipment-heavy NASA research contract. Most of the other contracts make no such provision for equipment, facilities, or employees.

[85] EC RPQ 324, para. 46.

50. In making this argument, the EC puts itself in the position of the blind man in the fable who, after feeling the trunk of an elephant, insists that an elephant is just a type of snake. In this case, the EC notes a few statements from NASA officials and NASA program materials, and insists that they by themselves reveal that the sole purpose of NASA aeronautics is "providing goods and services to Boeing." The EC goes on to assert that this isolated impression based on a few pieces of information, provides a "context," and that even conflicting evidence must be interpreted to conform with that context. Following this interpretative theory, the EC insists that even evidence showing that NASA seeks broad dissemination of knowledge must be interpreted as meaning the opposite of what it says, that NASA seeks to give everything only to Boeing.[86] (This is rather like the blind man insisting that the elephant's leg, torso, and ears, must also be snakes because the trunk feels like one.) This type of reasoning is not the "weighing" of all the evidence or assessment of its credibility that a Panel must perform under Article 11 of the DSU.[87] It is instead the "double standard of proof," that the Appellate Body condemned in *US – Cotton Subsidies (Article 21.5)(AB)* – "one standard, relaxed and permissive, for the complainants, and another, very strict and demanding, for the defending party."[88]

51. Any evaluation of the EC's "inference" as to the purpose of NASA aeronautics research must look at *all* of the evidence, including the facts that:[89]

- NASA's governing statute instructs it to pursue "{t}he expansion of human knowledge of the Earth and of phenomena in the atmosphere and space."
- Airbus' own engineers admit that NASA research has a "generic and academic value" to Airbus.[90]
- NASA purchases research services from a wide variety of entities in a wide variety of industries.[91]
- The NASA officials quoted by the EC have in fact testified to their desire to disseminate NASA's knowledge not just to U.S. aircraft manufacturers, but to users of aircraft throughout the world.[92]

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[86] EC RQ 324, para. 49.

[87] *Brazil – Tyres (AB)*, para. 184 ("This assessment implies, among other things, that a panel must consider all the evidence presented to it, assess its credibility, determine its weight, and ensure that its factual findings have a proper basis in that evidence.").

[88] *US – Cotton Subsidies (21.5)*, para. 293, *quoting Korea – Alcoholic Beverages (AB)*, para. 164.

[89] *Brazil – Tyres (AB)*, para. 184.

[90] Statement by Patrick Gavin, Tim Sommer, Burkhard Domke, and Dominik Wacht, para. 72 (Exhibit EC-1175).

[91] US RPQ 159, para. 148.

[92] US SNCOS, para. 41.

- NASA maintains the largest open library of aeronautics research in the world, available to scientists throughout the world, who may obtain documents at little or no cost.[93]

- NASA insists that *all* of the research it funds be disseminated broadly.[94] As a result, scientific reports funded by NASA programs issue as soon as they meet publication standards, throughout the life of a program and beyond.[95]

- Scientists throughout the world access and cite NASA reports, including the publications generated by Boeing under the programs challenged by the EC, showing that the knowledge generated by NASA provides a foundation on which everyone – including Airbus – can build.[96] This information would not exist in the public sphere if NASA did not fund the research and publish the results.

- An even wider group of industries participate in NASA conferences, provide advice to NASA, and participate in its programs.[97]

All of this evidence goes beyond the isolated statements of a few officials and demonstrates what NASA actually does. They are not the statements and actions of an agency seeking to spend its money to the sole advantage of Boeing or U.S. producers of civil aircraft. These facts, which the EC has never rebutted, show that it was not reasonable to infer that NASA conducted transactions with outside entities "in order to bring about LCA-related technologies and provide the resulting goods and services to Boeing."

52. This contrary-to-fact inference provides the sole support for the EC's treatment of payments to other entities as a financial contribution and benefit to Boeing. There is accordingly no basis to treat such payments as a financial contribution, a benefit, or the value of a benefit to Boeing, as the EC seeks to do. Thus, outside of the small number of Space Act Agreements, the

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[93] US FWS, para. 209; US FNCOS, paras. 19, 56, and 63.

[94] This is true even of the small volume of research protected by limited early release clauses, as the United States discusses below in its comment on the EC response to Question 325.

[95] The Integrated Wing Design ("IWD") Project, which the EC treats as a benefit exclusive to Boeing, resulted in the publication of 67 papers, which were cited 369 times, including 40 citations in Europe. This project was only one element of the larger Advanced Subsonic Technology ("AST") Program. US SWS, paras. 67; US RPQ 23, para. 73; US RPQ 186, para. 208; *List of publications based on work performed in the Integrated Wing Design (IWD) Project* (Exhibit US-1140(revised)).

[96] *List of publications based on work performed in the Integrated Wing Design (IWD) Project* (Exhibit US-1140(revised)). NASA's contracts with Boeing alone under the eight challenged programs produced 291 published scientific reports that were cited 1036 times, including 250 citations in Europe. *Reports and articles published by Boeing/McDonnell personnel pursuant to aeronautics research contracts* (Exhibit US-1253).

[97] US FWS, para. 193; *Membership of the NASA Advisory Council, 1997-2007* (Exhibit US-143); US SWS, para. 64, note 102.

EC has failed to meet its burden of proof with regard to the existence of a provision of goods and services.

53. These are not the only errors in the EC's response to this question. At one point, the EC asserts that "{t}he key question is whether NASA's spending under the programmes at issue, regardless of the particular entity that initially receives the funds, *relates* to the production and development of civil aircraft."[98] This "question" is, in fact, irrelevant to the financial contribution and benefit analyses. The answer would not provide evidence of the existence of a financial contribution, or identify the recipient of a financial contribution. It also sets far too low a threshold to be of use in the benefit analysis, which revolves around whether the government made a financial contribution "on terms more favourable than those available to the *recipient* in the market."[99] That a program "relates" to a product does not mean that it conferred a benefit on the producers of that product. For example, if NASA made grants to universities that conduct aeronautics research, they would certainly be "related" to aeronautics, but that fact would indicate nothing about whether Boeing received a benefit from the transaction. The EC's view that this is the "key question" betrays a fundamental error in its efforts to identify and value NASA research that supposedly conferred a financial contribution and a benefit to Boeing.

54. The EC's assertion that NASA funding "relates to the production and development of civil aircraft" also fails as support for its subsidy allocation methodology, which treats a huge portion of NASA's aeronautics research budget as exclusively benefitting civil aircraft. As the United States explains below in its comments on the EC responses to Questions 332 and 335,[100] that something also "relates" to civil aircraft proves nothing about whether it "relates" to other products or services. In fact, the United States has shown that NASA research is of use in several sectors outside of civil aircraft production, including the production of civil aircraft parts, the production of military aircraft, and the supply of air transportation services.[101]

55. Another error is the EC's assertion that it lacked information to evaluate alleged payments under contracts and alleged provisions of goods and services separately.[102] In fact, the publicly available documents, the documents released by NASA under the U.S. Freedom of Information Act, and the information from the DS317 Annex V process that the EC refused to make available in this proceeding provided a wealth of information. Of course, all of it showed that the alleged subsidies involved dollar values far less than the number the EC derived from its "top down" approach. That might make the EC's version of a "top-down" approach an attractive

[98] EC RPQ 324, para. 45.

[99] *Canada – Aircraft (AB),* para. 157 (emphasis added)..

[100] In the U.S. comment on the EC response to Question 335, the relevant discussion appears in the introduction.

[101] US RPQ 343, paras. 128-129, 134-137; and US RQ 344, paras. 145-150 and 152.

[102] EC RPQ 324, para. 44.

choice for a complaining party. However, it should make that approach unacceptable in a WTO dispute.

325. Please direct the Panel to the arguments in the submissions of the European Communities and evidence on record regarding the terms upon which NASA provided the US civil aircraft industry access to results of research performed under the NASA aeronautics R&D programmes at issue by entities outside the US civil aircraft industry.

56. The question sought evidence as to the "terms" of "access" that NASA gave Boeing and other members of the U.S. civil aircraft industry to the results of research performed by entities outside the civil aircraft industry. The EC does not actually answer this question, but instead devotes its response to proving a point that the United States has never contested – that some NASA Space Act Agreements provide facilities, equipment, and employees to outside entities.

57. To give the answer the EC avoided, in general, the U.S. civil aircraft industry has access to the results of NASA research conducted by entities outside the civil aeronautics industry on the same terms as any other U.S. industry, or any foreign entity, for that matter. It can download materials off the NASA technical reports server or pay a nominal amount for a hard copy. The EC describes activities under Space Act Agreements, but fails to explain how these agreements, which relate to NASA's facilities, equipment, and employees, are relevant to the Panel's question, which addresses results of research performed by entities outside the civil aircraft industry. The EC also neglects to mention the terms of these agreements, which required Boeing to provide its own "fair and reasonable" contribution of resources *to NASA* in exchange for any facilities, equipment, or employees contributed by the agency. The partner's contribution can take the form of a monetary reimbursement, or the provision of in-kind goods, services, or data.[103] The EC demonstrates little access under NASA research contracts to the results of research conducted by entities outside the civil aircraft industry. In any event, the contracts themselves spell out the terms, which make clear that all research results are disseminated widely.

58. The EC devotes most of its response to asserting that Space Act Agreements gave Boeing access to NASA personnel, facilities, and data.[104] The United States has never contested that this occurred. One important use of Space Act Agreements is to memorialize such joint research activities, and specify the exact contributions each party will make. However, while the EC references several Space Act Agreements, it never addresses their *terms*. As noted above, to the extent that a Space Act Agreement gave Boeing "access" to NASA research and research results,

[103] US FWS, paras. 233-234; US RPQ 18, para. 39; US RPQ 160, paras. 150-154; and Exhibit US-74.

[104] EC RPQ 325, para. 53.

Boeing also gave NASA valuable assets, which the agency could then use in government research, and disseminate the results.[105] Thus, the transactions provided adequate remuneration.

59. For example, SAA 228, which the EC cited, was part of the Airframe Structural Integrity Program, a cooperative effort between NASA and the Federal Aviation Administration, the U.S. agency responsible for aircraft safety. Its goal was "to develop advanced technology that may be used by the U.S. airline operators and aircraft manufacturers to economically extend the life of high-time airplanes in the commercial jet transport fleet" by developing testing devices to identify cracks that might result in air disasters.[106] The end result was to be crack detection equipment that NASA proposed to license to U.S. manufacturers and airlines.[107] As many U.S. airlines own Airbus aircraft, Airbus would also benefit from the technology. NASA agreed to provide fatigue and cracking data necessary to predict fatigue crack initiation and growth and the residual strength of aircraft structures.[108] Boeing agreed to provide its own crack initiation and growth data to serve as a benchmark for NASA's crack prediction methodology, samples of damaged aircraft structures for testing purposes, and Boeing proprietary data on fatigue and fracture behavior of advanced materials.[109] The agreement allowed Boeing personnel access to two NASA laboratories, but only to work on "mutually agreed specific research assignments."[110]

60. This example, which is similar to the other agreements cited by the EC, shows also that NASA Space Act Agreements carefully define both the scope of the access to NASA facilities and the participation of NASA employees, and specify exactly what data will be made available.[111] The terms require Boeing to deliver equally valuable information and other resources to the common project. The whole transaction advances the government's objective of

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[105] The EC notes that NASA typically agrees to protect the proprietary information of Space Act Agreement parties. EC RPQ 325, para. 53, last bullet. This is no different than what NASA does with contractor proprietary data received under contract. Such protections do not prevent NASA from using the Boeing data in NASA's own research and disseminating the resulting scientific conclusions to the public, in accordance with the agency's objective of "expansion of human knowledge of the Earth and of phenomena in the atmosphere and space" and "provid{ing} for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof." Space Act, sections 102(d)(1) and 203(a)(3) (Exhibit EC-268).

[106] SAA 228, art. 3.0 (Exhibit US-501).

[107] SAA 228, art. 3.6 (Exhibit US-501).

[108] SAA 228, paras. 5.1 and 5.2 (Exhibit US-501).

[109] SAA 228, paras. 5.3, 5.4, and 5.5 (Exhibit US-501).

[110] SAA 228, art. 5.6 (Exhibit US-501).

[111] *E.g.*, SAA 214, art. 5.4 (Exhibit US-500) ("NASA LaRC and Boeing will share data from the NDE quantification and characterization of corrosion in the fatigue specimens for the U.S. Air Force corrosion fatigue test program"); SAA 228, art. 52. (Exhibit US-501) ("NASA LaRC will generate and provide to Boeing the crack tip opening angle CTOA DATA on materials supplied by or recommended by Boeing that is necessary to use the elastic-plastic fracture methodology developed at NASA LaRC to predict the residual strength of built-up structure").

promoting the safety of air travel.[112] Thus, the *terms* of the access make clear that any provision of goods or services, including access to data resulting from prior NASA research, confers no benefit to Boeing, as the company contributed equivalent money, goods, services, or data to NASA in exchange.

61. In addition to the deficiency of its discussion of the *terms* under which NASA allows access to the results of research, the EC's analysis of Space Act Agreements is also nonresponsive to the Panel's request for information related to "access to results of research performed . . . by entities outside the US civil aircraft industry." The agreements cited by the EC deal with the activities of *NASA* personnel, the use of *NASA* facilities, and access to data generated by *NASA*. The EC attempts to fill this gap by asserting that "when NASA agrees to share data with Boeing developed 'in' or 'in connection with' various 'Program{s},' this is broad enough to include data obtained by NASA from outside entities pursuant to research done by those outside entities in connection with those "Program{s}." However, the observation that programs are "broad enough" to cover results of research performed by other entities means only that program data *may* include such results. Such a statement does not meet the burden of proof for the EC's statement that NASA *actually gave Boeing* the results of research conducted by other entities.[113] It also fails to answer the Panel's question about the terms of the alleged transfers. Nor does it prove that Boeing's access was any different from what the rest of the world – including Airbus – received through access to NASA's on-line and hard-copy libraries.

62. The EC also cites to a string of earlier submissions that it says show that "NASA collaborates with Boeing, and transfers to Boeing goods and services for LCA-related R&D, including research results obtained under the programmes at issue through both internal and external research."[114] The cited arguments say nothing to support this conclusion. Rather, they contain repeated references to a few documents, none of which support the EC's position. Specifically, most of the cross-referenced arguments discuss the same irrelevant Space Act Agreements that the EC cited in response to this question. As the United States has explained, these agreements show only that NASA gave access to its own data, facilities, and employees in exchange for access to valuable goods, services, and other data from Boeing.[115] The EC cites no references to third party research results. The EC also cross-references a brief discussion of equipment provided pursuant to Contract NAS1-20546, which does not have anything to do with the results of research conducted by entities outside of the civil aircraft industry.[116] Thus, most of the text cited by the EC is irrelevant to the question asked by the Panel.

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[112] Exhibit US-74 describes the contributions of both NASA and Boeing under the Space Act Agreements submitted by the United States.

[113] The same rules that prohibit NASA from releasing companies' proprietary data to the public prevent the disclosure of one contractor's proprietary data to another.

[114] EC RPQ 325, para. 52.

[115] EC SWS, paras. 389 and 392-396; EC RPQ 148(e), para. 191.

[116] EC SWS, para. 388; EC RPQ 148(e), para. 189.

63. The one area in which Boeing received the results of a subset of other entities' research before it became generally available was with regard to certain work done under the HSR Program and the ATCAS research funded under the ACT Program. But, what the EC fails to realize is that these are not examples of a general rule, but instead result from carefully circumscribed contract clauses that NASA used only in a limited number of contracts funded through the ACT, HSR, and AST Programs in order to entice contractors to contribute their own certain commercially sensitive data, developed with the contractors' own funds. To be clear, the general rule on data availability under these programs was the same as in all NASA research – the government obtained unlimited rights in all data developed under the contract, which included the right to disseminate results immediately.[117] However, certain contracts provided an exception – the "for early domestic dissemination" ("FEDD") clause under the ACT Program and the "limited exclusive rights data" ("LERD") clause under the HSR and AST Programs – requiring the government to withhold a subset of data from public dissemination. During a limited period – two years for the ACT and AST contracts and five years for the HSR contracts – each contractor had an obligation to share data with other program participants.[118] These clauses did not appear in contracts funded through the HPCC, Aviation Safety, QAT, Vehicle Systems, or R&T Base Programs, which accounted for the large majority of the EC's alleged subsidy value. After the end of the limitation period, NASA was free to disseminate the previously restricted data. Boeing's engineers have made clear that the 787 did not use any of the results of research performed under the ACT, HSR, and AST programs,[119] regardless of whether that research was subject to standard data rights clauses or the FEDD or LERD clauses.

64. The EC neglects to note that access to data under the LERD and FEDD clauses was not a one-way transmission of data from other contractors to Boeing. Boeing had an equivalent obligation to allow other contractors access to its own data. As the EC notes, a broad group of participants worked under the ATCAS program, including "US airline maintenance organizations, numerous industrial and university subcontractors, and a significant number of

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[117] *E.g.*, Contract NAS1-18889, sec. I.1, incorporating clauses 52.227-14 (Rights in Data General (Jun. 1987) – as modified by 18-52.227-14 NASA FAR Supplement (Apr. 1984)) (Exhibit EC-329); Contract NAS1-20220, sec. H-6(b) (providing unlimited rights in all data produced under the contract, except as provided in the limited exclusive rights data clause) (Exhibit EC-347).

[118] *E.g.*, Contract NAS1-18889, sec. H-9 (providing "early dissemination of such data in the U.S. Government and U.S. domestic industry prior to general publication.") and H-9A ("Information for general release will be two (2) years from publication date indicated on the document.") (Exhibit EC-329); Contract NAS1-20220, sec. H-6(b) (providing unlimited rights in data first produced in performance of the contract, except for limited exclusive rights data) and sec. H-6(6)(4)(ii) (limited exclusive rights data protections to be terminated within five years unless otherwise stated) (Exhibit EC-347).

[119] Affidavit of Michael Bair, paras. 24, 38-39, and 46 (Exhibit US-7); Affidavit of Douglas N. Ball, paras. 5-9 (Exhibit US-1257); Affidavit of Alan G. Miller, paras. 4, 6, and 8-20 (Exhibit US-1258).

technical personnel at NASA."[120] This observation underscores the relevance of this program beyond the confines of the civil aircraft industry.

65. The EC also neglects to note that contracts with engine manufacturers accounted for 52 percent of the contract payments under the HSR Program.[121] Thus, the large majority of any research to which Boeing had "access" under that program was engine research, which the EC admits is of no use in Boeing's design of large civil aircraft.

66. Finally, the EC notes that NASA provides access to certain computer codes, including the agency's OVERFLOW code, to Boeing. [122] However, many entities both inside and outside the civil aircraft industry also received the code: six NASA centers, 25 other U.S. government laboratories, eight major aerospace companies, 14 other aerospace companies, one automotive manufacturer, eight computer companies, 71 other companies, and 28 universities.[123] Moreover, as Boeing helped NASA to develop that particular code,[124] this is not an example of NASA providing research results to Boeing, but rather the other way around.

67. In sum, to respond to the question from the Panel that the EC failed to answer, the evidence demonstrates the following terms for Boeing's access to the results of research funded by NASA but conducted by entities outside the civil aviation industry:

- For research reports in NASA's on-line or hard copy libraries, Boeing pays the same as everyone else: nothing to download electronic documents, and a nominal fee for hard copy documents or materials on electronic media.

- For research funded under the HPCC, Aviation Safety, QAT, Vehicle Systems, and R&T Base Programs, which accounted for the majority of the value of alleged subsidies, the EC has provided no evidence of Boeing having such access, outside of publicly available channels described above.

- For research funded under the ACT, HSR, and AST Programs, but not subject to early domestic dissemination or limited exclusive rights clauses, the EC has provided no evidence of such access outside of publicly available channels described above.

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[120] EC RPQ 329, para. 55, *quoting* L. Ilcewicz *et al.*, "Advanced Technology Composite Fuselage – Program Overview," printed in *Fifth NASA/DOD Advanced Composites Technology Conference*, NASA Conference Publication 3294, Vol. I, Part 1, May 1995, p. 2 (Exhibit EC-1419).

[121] US RPQ 344, para. 145.

[122] EC RPQ 329, para. 55.

[123] List of OVERLOW Users (Exhibit US-1270).

[124] EC RPQ 329, para. 55.

- For research funded under the ACT, HSR, and AST Programs that was subject to early domestic dissemination or limited exclusive rights clauses, Boeing obtained access to other entities' research results in exchange for allowing them access to its own results. Access through this channel ended after a specified two- to five-year time. Today, Boeing has the same access that is available through publicly available channels.

- For research conducted through Space Act Agreements, the EC provides no evidence that Boeing obtained access to data generated by other entities outside of publicly available channels described above.

- OVERFLOW is available to anyone in the United States who writes a letter to NASA requesting the code. It is typically delivered at no cost by e-mail.[125] Other NASA computations fluid dynamics codes may be subject to intellectual property restrictions, information technology security, or export control concerns.

Thus, access to the results of research conducted by entities outside the civil aircraft industry was rare, limited, and subject to requirements that Boeing provide its own research results in return.

329. How does the European Communities respond to US Comments on EC RPQ 167, which asks "{i}f the EC really believes that aeronautics research is fungible between military and civil aircraft – its position with regard to DoD's military research – why does it not allocate a proportionate share of the value of NASA research to Boeing military aircraft?"

68. The United States explained in its response to Question 343 that NASA research is general in nature, and applies across a wide variety of disciplines, including military aviation.[126] In contrast, DoD research focuses on weapons and weapons systems, and has little relevance outside of the military sphere.[127] Even in the small area of overlap where potential dual-use applications of its technology exist and its regulations permit, DoD seeks to use the civil applicability to obtain a contribution from the contractor that will reduce the agency's cost of achieving its military objectives.[128]

69. The EC does not dispute that NASA research has a broader focus and applicability than DoD's. It contends instead that Boeing has an incentive to devote any NASA funding it receives

[125] Overset Grid CFD Software, p. 2 (Exhibit US-1233).

[126] US RPQ 343, para. 137.

[127] US FWS, paras. 127-145; US FNCOS, para. 48-49; US RPQ 208(a), paras. 266-288; US RPQ 208(b), paras. 289-294; US RPQ 208(c), paras. 295-298; US RPQ 208(d), para. 299; and US RPQ 208(e), paras. 300-318.

[128] US FWS, paras. 124-126.

exclusively to civil research, and to devote as much of its DoD funding as possible to dual-use technologies applicable to large civil aircraft.[129]

70. This supposition is wrong at every level. First, the perception of particular "incentives" is not evidence that an enterprise or individual actually behaved in a particular fashion.

71. Second, the EC's discussion of Boeing's "incentive to fund the development of technologies applicable to its LCA through DoD RDT&E" and "incentive to direct all {NASA} funding and support to the development of technologies particularly related to civil aircraft"[130] assumes that Boeing has a choice in how it uses agency funds. This is entirely incorrect. NASA and DoD both define research objectives for themselves; decide for themselves whether to pursue objectives through procurement, assistance instruments, or in-house work; and craft statements of work to achieve those goals. All of the DoD contracts before the Panel, and most of the NASA contracts were awarded after competitive bids, so that Boeing had no certainty about winning a particular contract.[131] If the agency awarded Boeing the contract, the company received reimbursement only for activities specified in the statement of work. Thus, Boeing's contracts did not allow it to decide to develop dual-use technologies of its choice or to decide whether to spend NASA reimbursements on projects of interest to BCA rather than IDS. In fact, if the company were to follow the course of action described by the EC, it would violate U.S. law regarding permissible activities for which to seek reimbursement.

72. More fundamentally, the EC also has the incentives wrong. Boeing has no incentive to seek NASA funding for commercially relevant research because it knows NASA will disseminate the results, which would eliminate any commercial advantage.[132] Boeing also has no incentive to "develop dual-use technologies that are equally applicable to military and civil aircraft through the DoD RDT&E Program" because the military use would trigger export controls, which would prevent use of any resulting technology on exported civil aircraft.[133]

73. The EC also attempts to defend its assertions regarding research incentives by arguing that the challenged NASA programs involved only civil research. As usual it relies on selective quotation, rather than a more thorough analysis. Had the EC looked further, it would have recognized that the AST and R&T Base Programs both involved research into hypersonic flight, which is only relevant to military aircraft even under the CRA's skewed view of aeronautics

[129] EC RPQ 329, para. 57.

[130] EC RPQ 329, paras. 57 and 62.

[131] US RPQ 190, para. 226.

[132] Affidavit of Michael Bair, paras. 6 and 33 (Exhibit US-7).

[133] US FWS, paras. 166-176.

research.[134] In addition, as Boeing never developed a supersonic civil aircraft, any supersonic research under the HSR Program would be relevant only to military aircraft. Moreover, had the EC examined the contracts submitted by the United States, it would have recognized that one of the contracts funded through the HSR Program contained research explicitly devoted to a hypersonic aircraft, which can only have been a military application.[135] Thus, there is no support for the EC assertion that NASA research involved exclusively civil topics, or that NASA's payments to Boeing under research contracts went exclusively to civil research.

74. The EC also contends that DoD "assumes virtually all of the risk of Boeing's development of military aircraft."[136] It is wrong. DoD's cooperative agreements provide a contractual vehicle that allows risk sharing with private entities in appropriate circumstances.[137] DoD does bear some of the risk of development projects, but for the same reasons a commercial entity would. Its position as the sole purchaser of advanced weapons systems, its "optimistic requirements" for new systems, its long development cycle, and the vagaries of development funding from year to year make it an unusually risky customer,[138] and suppliers are unwilling to assume all of that risk themselves. However, the whole point of DoD's limited funding of research into dual-use technologies is to avoid that riskiness, and leverage civil sector resources to reduce the cost of achieving military objectives.[139] The notion that Boeing research into dual-use technologies could take advantage of DoD's risk-sharing regime disregards both DoD's objectives in the limited situations in which it funds dual-use technology development and its objectives in carrying the risk for developing weapons systems.[140]

75. The EC also attempts to support its characterization of the funding incentives facing Boeing by resurrecting the assertion from its first written submission that DoD pays Boeing excessive incentive fees.[141] However, it misunderstands the availability of award and incentive

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[134] Exhibit EC-1176, p. 29. Even in its efforts to defend attribution of hypersonic flight research to large civil aircraft, the EC asserts only that it is "also relevant" to large civil aircraft, implicitly recognizing that only military aircraft fly at hypersonic speeds. EC RQ 335(a), para. 84.

[135] Contract NAS1-20013, Exhibit A, Secs. A and C (Exhibit US-538(HSBI)) (referring to hypersonic vehicles capable of "repeated missions" and requiring the contractor to have access to literature covered by the International Traffic in Arms Regulations).

[136] EC RPQ 329, para. 60.

[137] *E.g.*, Cooperative Agreement F33615-98-2-5113, pp. 11 and 20 (Exhibit US-636) (providing for cost sharing by DoD and industry participants to develop nondestructive evaluation ("NDE") techniques and equipment for early detection of cracks in existing aircraft, extending their useful life).

[138] *Best Practices, Increased Focus on Requirements and Oversight Needed to Improve DoD's Acquisition Environment and Weapon System Quality*, p. 17 (Exhibit EC-1380).

[139] US FWS, paras. 124-125.

[140] In making this point, the EC notes that airplanes can be weapons systems. This is correct as to fighters and bombers. It is not correct as to large civil aircraft.

[141] EC RPQ 329, para. 59.

fees. The "fee" is the element of a cost-based contract that allows for the contractor to earn a profit, and an "award fee" or "incentive fee" is a mechanism available only in a specific funding vehicle, called an "award fee contract" or "incentive fee contract," that allows DoD to increase the amount of the fee if the contractor performs particularly well. However, the most common vehicles used by DoD for explicit dual-use research were cooperative agreements and Other Transaction Agreements, which prohibit the payment of a fee. Incentive and award fees are also not common tools in the type of research contracts challenged by the EC. Of the 85 procurement contracts and delivery orders listed in Exhibit US-1246 and its attachments, only one provided for an award or incentive fee.[142] The contracts submitted by the EC were all cost-plus-fixed-fee contracts, cooperative agreements, or Other Transactions,[143] none of which provide for award or incentive fees. Thus, the potential for obtaining award fees would not motivate Boeing to seek DoD funding of its commercial research and development costs.

76. In short, the EC's response to this question provides no support for its self-contradictory position of attributing NASA research exclusively to civil aircraft.

330. How does the European Communities respond to the argument of the United States that the European Communities' response to Panel Question 171 "highlights the asymmetric burden of proof it seeks to impose on this proceeding" and that the "standards it seeks to

[142] The award fee was available for Delivery Order 26 under Contract N00019-04-G-0007, which was accounted for approximately 4 percent of the payments under contracts listed in Exhibit US-41(revised). Most of the other contracts and delivery orders were cost-plus-fixed-fee contracts, which do not allow for ward fees. Exhibit US-700(HSBI), p. 27; Exhibit US-1246, attachment 3. Contract F33615-91-C-5716, p. 19 (Exhibit US-625); Contract F33615-92-C-3406, p. 8 (Exhibit US-620); Contract F33615-93-C-4302, p. 15 (Exhibit US-634); F33615-93-C-4334, p. 12 (Exhibit US-633); Contract F 33615-94-C-2503, p. 8 (Exhibit US-621); F33615-94-C-3000, p. 10 (Exhibit US-619); Contract F33615-94-C-3001, p. 8 (Exhibit EC-838); Contract F33615-94-C-3400, p. 10 (Exhibit US-622); Contract F3361594-C-5009, p. 9 (Exhibit US-627); Contract F3361595-C-5225, p. 8 (Exhibit US-628); Contract N00019-95-C-0071, sec. II, p. 3 (Exhibit US-616); Contract F33615-96-C-1958, p. 11 (Exhibit US-618); Contract F33615-97-C-3219, p. 9 (Exhibit US-642); Contract F33615-97-C-5720, p. 11 (Exhibit US-631); Contract F33615-99-C-5019, p. 2 (Exhibit US-629); Contract F3361500-D-3052, p. 2 (Exhibit US-639); Contract N00019-01-C-0133 (Exhibit US-617, p. 96/97); Contract F33615-02-C-5206, p. 3 (Exhibit US-606); Contract F33615-03-D-2358, p. 2 (Exhibit US-696); Contract FA8650-04-C-5001, p. 3 (Exhibit US-599); FA8650-05-C03500, p. 3 (Exhibit US-602); Contract FA8650-05-C-3562, p. 3 (Exhibit US-699); Contract FA8650-05-C-3563, p. 3 (Exhibit US-697); Contract FA8650-06-C-5210, p. 3 (Exhibit US-698); Contract F33615-00-D-3052, delivery orders, p. 2 (Exhibits US-644 through US-693). There was one firm fixed price delivery order, and two time-and-materials delivery orders, both types of instruments that do not allow an award fee. Contract N00019-04-G-0007, delivery orders 27, 38, and 43 (Exhibit US-700, pp. 2-3, 9-10 & 55/89).

[143] Contract F33615-91-C-5716, p. 19 (Exhibit EC-507); Contract F33615-91-5720, p. 38 (Exhibit EC-508); Contract F33615-92-C-5971, p. 5 (Exhibit EC-509); Contract F33615-93-C-4334, p. 12 (Exhibit EC-510); Contract F33615-99-C-5019 (Exhibit EC-511); Contract F33615-97-C-3219, p. 9 (Exhibit EC-514); Contract F33615-92-C-3406, p. 8 (Exhibit EC-827); Contract F33615-94-C-3001, p. 8 (Exhibit EC-838); Contract F33615-94-C-3007, p. 10 (Exhibit EC-1143). The following agreements were Other Transactions: F33615- 98-3-5103 (Exhibit EC-517), F33615-98-3-5104 (Exhibit EC-518), and N00014-3-0004 (Exhibit EC-496). The remaining contracts submitted by the EC were cooperative agreements, indicated by the presence of a "2" as the ninth character in the contract number.

impose on the Panel's evaluation have no basis in the DSU, the SCM Agreement, or the findings of the Appellate Body or any panel." (US Comments on EC RPQ 171, para. 292)?

77. In the statement quoted by the Panel, the United States noted:

> In the EC's view, its only obligation as complaining party is to present "estimates" in light of "imperfect information" that provide an indication of the amount of subsidies that may be "inexact." In contrast, the EC's view of the burden on a responding party goes beyond exactness – to provide "a detailed accounting of every dollar spent" indicating "not only where NASA and DoD spent this money, but also precisely what was done with this money." In the EC's apportionment of burdens, it is irrelevant that information may not exist because of the vast span of time covered by the EC claims, or may not be available in the form demanded by the EC because government accounting systems were not designed to address its assertions.[144]

78. The EC responds to this question by denying any intent "to impose an asymmetric burden of proof."[145] However, its subsequent arguments confirm that the burden it seeks to impose is exactly as described by the United States: that the EC may resort to estimates because of "imperfect information,"[146] that the unavailability of information from many years ago is irrelevant,[147] and that available information organized in a form different than the way the complaining party has presented its arguments is irrelevant.[148] The EC does not deny that it views an "accounting of every dollar" as a prerequisite for any rebuttal of its arguments, although it does argue that the quantity of information required for such an exercise "is not excessive."[149] This last statement has no credibility. The EC has argued that validation of the U.S. estimate would require copies of "all contracts and sub-contracts with all entities that

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[144] US RPQ 171, para. 292.

[145] EC RPQ 330, para. 65.

[146] EC RPQ 330, para. 68.

[147] EC RPQ 330, para. 69.

[148] EC RPQ 330, para. 70. In making this last argument, the EC asserts that there are "deficiencies in the {U.S.} accounting systems." That is not the case. The procurement systems do what they were designed to do – provide information related to spending under contracts. The budgeting systems do what they were designed to do – provide information that allows an agency to plan and track spending at a program level. They do not provide information relating to the use of government property or the work of government employees because government property and government employees serve government functions, not contractors' needs. The systems do not track every dollar from the Treasury to its ultimate recipient, as such a system would be immensely burdensome and complicated, and existing systems do a good job in ensuring that agencies spend no more than they are authorized to spend.

[149] EC RPQ 330, para. 68.

receive payments,"[150] an exercise that would involve hundreds of contracts, with hundreds of entities, covering tens of thousands of pages.[151]

79. These arguments call for precisely the "double standard of proof" that the Appellate Body condemned: "one standard, relaxed and permissive, for the complainants, and another, very strict and demanding, for the defending party."[152] For example, the EC proposes that "imperfect information" in the data underlying its estimates is of no concern.[153] However, it argues that imperfections (all of them imaginary) in NASA's valuation of aeronautics research contracts with Boeing necessitate rejection of that information. The EC relies on a limited number of statements to allege that NASA and DoD supply goods and services to Boeing pursuant to contracts. However, when the United States demonstrates that the contracts themselves list relatively few goods and services, and that these are not "provided" to Boeing, the EC argues that the Panel must disregard the contracts as "incomplete" or "unverifiable."[154] The EC contends that its own estimate, while imperfect, is acceptable, while insisting that the United States must account "for every dollar" that NASA spent.

80. Thus, in spite of its protests to the contrary, the EC does advocate an asymmetric burden of proof. In fact, only if the Panel disregards the evidence cited by the United States, and uses the EC estimate as an adverse inference, can the EC prevail in its allegations of massive subsidization. The EC has provided no basis in the DSU, or any other covered agreement, that would justify such an imbalanced assessment.

331. What is the precise legal basis in the DSU for the view that a responding Member in a dispute under Part III of the SCM Agreement must provide "access to the records and databases that were reviewed (or, at a minimum, submit{..} the results of the review)." (EC Comments on US RPQ, 182, para. 184)?

81. The EC's response provides no legal basis for its view that a responding Member in a dispute under Part III of the SCM Agreement must provide "access to the records and databases that were reviewed or (or at a minimum, submit{} the results of the review)." It merely asserts without explanation that the source of this obligation is the "rules on burden of proof" discussed in the response to Question 330. As that response provides no legal support for the standard

[150] EC RPQ 170, para. 291.

[151] NASA had 86 contracts with Boeing alone under the challenged programs, and Boeing accounted for approximately one-tenth of total spending on aeronautics research. Exhibit US-1305, US RPQ 175, para. 159. Typical contracts have 50 or more pages, and may result in 50-100 pages of modifications. Many contracts and supporting documents contain HSBI or BCI, which means that the government could not release them without the consent of the contractor, and only after the contractor had reviewed the documents and made the necessary markings.

[152] *US – Cotton Subsidies (21.5)*, para. 293, *quoting Korea – Alcoholic Beverages (AB)*, para. 164.

[153] EC RPQ 330, para. 68.

[154] EC Response to Question 316(b), para. 5.

enunciated by the EC, the only remaining conclusion is that the EC can conceive of no legal justification for its proposal.

332. How does the European Communities respond to the argument in US Comments on EC RPQ 163(b), para. 230, that the European Communities' observation that NASA's work is "related" to civil aircraft does not mean that it is exclusively devoted to the US civil aircraft industry, and should be treated as a financial contribution (or benefit) to that industry?

82. The EC's response to this question raises only irrelevant points. It begins by asserting that its response to Question 324 justifies an inference that NASA's programs were intended to "support the U.S. civil aircraft industry." The U.S. comment on the EC's response to Question 324 demonstrates that the EC's characterization of NASA's mission is wrong, as the evidence shows that the agency seeks to develop foundational aeronautics knowledge, and makes that knowledge broadly available, to everyone, including Airbus. Moreover, the United States has demonstrated that the government's purpose for taking a particular action does not, as a legal matter, indicate the existence of a financial contribution or benefit.[155]

83. The EC then notes that the United States has not asserted that NASA programs are completely unrelated to civil aviation. This statement is as irrelevant as it is true. The fact, which the United States does not dispute, that much, but not all, of NASA's research is "related" to civil aircraft indicates nothing about whether it is also "related" to other areas. In fact, the point the United States originally made was that NASA research is foundational and, thus, relates to many areas of scientific interest, but not to any particular commercial product.

84. The EC then contends that the United States has failed to provide evidence that NASA's work also benefits other disciplines.[156] It concedes that entities outside the civil aircraft industry attended NASA conferences, participated in NASA research programs, and received funding to conduct research under those programs.[157] That evidence alone is sufficient to show that the NASA programs were of use to those entities and the sectors in which they participate. After all, enterprises in the airline and military aircraft industries would not attend NASA conferences unless NASA research was related to their business. However, the EC is wrong to assert that this is the only evidence presented by the United States. The United States demonstrated that military agencies, military weapons producers, and companies that produce spacecraft all use the wind tunnels that the EC proposes to treat as related exclusively to civil aircraft.[158] The United States showed military agencies, producers of military weapons, computer companies, and an

[155] US Comment on EC RPQ 320, *supra*.

[156] EC RPQ 332, para. 76.

[157] EC RPQ 332, para. 76.

[158] US RPQ 162, para. 155.

automotive company used NASA's OVERFLOW computational fluid dynamics code,[159] which the EC treats as exclusively related to civil aviation. The United States also explained that NASA technologies are used by airlines that own both Boeing and Airbus aircraft, another sector outside the production of civil aircraft.[160]

85. The EC, however, asserts that these entities participated in NASA programs and conducted research for NASA "in furtherance of the programmes' goals to support the US civil aircraft industry."[161] It cites no evidence for this proposition, and there is none. Both NASA's objectives and these entities' economic interests go beyond the sector producing civil aircraft. There is accordingly no basis to assume that their activities were relevant exclusively to Boeing.

86. The EC ends its attempt to defend allocation of NASA funding exclusively to civil aircraft by noting that the visualization software, high performance computing systems, and power systems and components sold by entities that participated in NASA research are "applicable to civil aircraft." This statement brings the argument around full circle. The United States has always recognized that much of the technology built upon NASA's foundational research is useful in civil aircraft. However, that applicability does not make the underlying research *exclusive* to civil aircraft, or *exclusive* to Boeing. To the contrary, when a U.S. supplier of aircraft components develops a technology for a civil aircraft component, there is no barrier to selling the item to Airbus or to entities outside of the civil aviation industry. Thus, there is no basis to treat NASA research programs as relevant exclusively to the U.S. civil aircraft sector.

333. How does the European Communities respond to the argument made by the United States (US Comments on EC RPQ 163(f), para. 245) that given the lists of participants in the R&D programmes referred to at para. 193 of the US First Written Submission there is no basis for the European Communities to treat NASA's aeronautics research as exclusively relevant to the US civil aircraft industry, or to allocate the cost of the research to that industry, regardless of whether or not such participants received funding under the programmes in which they participated?

87. The EC response to this question cross-references its responses to Questions 324 and 332. The U.S. comments on those responses demonstrate that the EC failed to respond to the Panel's questions, and has provided no evidence that NASA programs relate exclusively to the civil aircraft industry. Thus, there is no basis to allocate the value of any benefits found to exist exclusively to the civil aircraft industry.

88. The EC then contends that the United States has not established which portions of the challenged programs did not relate to civil aircraft and, therefore, has failed to rebut the EC case. This is a *non sequitur*. The EC's argument is that the NASA research it challenged is

[159] US RPQ 159, para. 149; List of OVERLOW Users (Exhibit US-1270).

[160] US FNCOS, paras. 58-59; US SNCOS, para. 41.

[161] EC RPQ 321, para. 76.

exclusively relevant to the non-engine civil aircraft industry, and must be treated as a financial contribution and benefit exclusively to the industry. In proving that NASA research is useful beyond the civil aircraft industry, the United States has rebutted the EC's argument as to exclusivity and, therefore, the basis for ascribing a huge portion of the research to Boeing. With respect to the funding actually provided to Boeing, the United States has shown (1) that the contract payments challenged by the EC were not financial contributions because they were used to purchase services,[162] and (2) that the transactions did not confer a benefit because their terms were no more favorable than are available in a market transaction.[163] The U.S. burden as responding party does not extend to providing a new set of calculations to replace the old, discredited EC calculations.[164]

335. How does the European Communities respond to the following arguments made by the United States in US Comments on EC RPQ 164:

89. The EC's introduction to its response to this question explains its methodology for valuing the alleged subsidies in a way that exposes its underlying legal flaw. (The factual flaws become clear in the responses to subsidiary parts of this question.) To recall, the EC started its estimation process with the whole NASA aeronautics research budget, removed a limited amount of research that clearly bore no relation whatsoever to large civil aircraft, and then treated all remaining research as applicable exclusively to the industry producing civil aircraft and parts.[165] The EC states that it included research spending related to hypersonic flight, rotorcraft, and unmanned vehicles in its total whenever "*some* (not all) research . . . <u>could</u> be applied to LCA"[166] and excluded research spending only where "it could be confident that the research at issue had <u>no</u> relation to LCA."[167] It applied the same standard to its analysis of air traffic management research, excluding spending only when "the research at issue was *wholly unrelated* to LCA,"[168] and including everything else. However, if only "some" of a research topic included in the EC estimate "could" be applied to large civil aircraft, the EC has conceded that the remainder had no application whatsoever. Thus, the EC's characterization of its methodology represents an admission that it has failed to meet its burden of proof with regard to the magnitude of the alleged subsidies – to "adduce{} evidence sufficient to raise a presumption that what is

[162] US FWS, paras. 213-217; US SWS, paras. 60-64; and US SNCOS, paras. 45-52.

[163] US FWS, paras. 218-225; US SWS, paras. 65-70; and US SNCOS, para. 53.

[164] The introduction to the U.S. comments on the EC response to Question 335(d)&(e) elaborates on this point.

[165] *See generally*, Exhibit EC-25, pp. 8-19. As incorrectly calculated by the EC, Boeing represented between 67 and 91 percent of that industry, and accordingly received the huge share of any alleged subsidies allocated to the industry producing civil aircraft and parts. Exhibit EC-18, p. 1.

[166] EC RQ 335, para. 79 (italics in original, underlining added).

[167] EC RQ 335, para. 79 (underlining added).

[168] EC RQ 335(d)&(e), para. 109.

claimed is true."[169] There can be no presumption that the EC's assertions as to the magnitude of the alleged benefit to Boeing are true when the "some" of that amount, by the EC's own admission, is inapplicable to large civil aircraft.

90. The EC's "could be applied" standard suffers a second legal flaw – it does not address *who* applies the results of the research. If other entities "apply" NASA research to make parts or equipment, and then sell them to Boeing for a market price, there is no "benefit" to Boeing in the sense of Article 1.1(b) of the SCM Agreement. Airbus' ability to buy parts or equipment from U.S. producers who participate in NASA research, underscores the absence of any benefit to Boeing. Similarly, when airlines or government agencies "apply" NASA research to improve the air traffic management system or enhance air transportation safety, Boeing receives neither a financial contribution nor a benefit in the sense of Article 1.1(b). The EC tries to get around this problem by arguing that a "benefit" accrues to Boeing because it supposedly has access to the results of research through channels unavailable to the public. But that still does not explain how research generated by other parties, which could be "applied" by other parties (to use the EC's term) becomes a "benefit" merely by reason of "access."

91. Finally, even if the EC could establish that research *could* be applied to large civil aircraft, which it has notably failed to do, that would not meet its burden of proof, which is to show that research spending by NASA actually *did* confer a benefit on Boeing.

92. This introductory discussion deals with the legal implications of the EC's admission that only "some" of the research it included in its allegations "could" be related to large civil aircraft. The EC's responses to the subsidiary parts of this question demonstrate that it has failed even to satisfy the lowered standard it sets for itself, because the evidence shows that none of the air traffic management, hypersonic flight, and unmanned vehicle research relates to large civil aircraft.

93. The EC also asserts that the U.S. criticism of its methodology relates only to certain research conducted under certain programs.[170] The EC fails to realize that the United States identified these errors as examples of the overall conceptual fallacy and carelessness of the EC's alleged subsidy magnitude calculation. These problems demonstrate the impossibility of calculating an accurate "top down" valuation calculation based on excluding some research and attributing the rest to the civil aircraft industry.[171] In fact, in preparing the response to the Panel's question, a further review of the materials that the United States did not fully review during preparation of the U.S. comments on EC RPQ 164 revealed *more* examples of research that should have been excluded.[172]

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[169] *US – Wool Shirts (AB)*, p. 14.

[170] EC RPQ 335, para. 81.

[171] US RPQ 343, paras. 124-134.

[172] *E.g.*, US RPQ 343, paras. 129 and 138139, notes 165 and 166; US RPQ 344, paras. 146-148 and 152.

(a) That the European Communities has inappropriately treated fundamental technologies related to hypersonic aircraft as equally applicable to LCA (US Comments on EC RPQ 164, para. 257);

94. The EC has taken self-contradictory positions on hypersonic flight over the course of this proceeding. The EC's consultants, CRA, which tended to apply a highly inclusive standard as to what research relates to large civil aircraft, stated:

> High temperature airframe structures would generally be more important in high supersonic, or hypersonic aircraft, for instance. The funding in this case was therefore excluded from the CRA analysis.[173]

The preparers of the EC's estimates of the value of NASA's research programs also excluded some hypersonic research.[174] In an effort to reconcile these statements with its inclusion of some hypersonic research in its subsidy magnitude calculation, the EC now takes the position that some research into hypersonic flight *is* related to large civil aircraft, but some is not. The evidence, as CRA recognized, does not support this assertion.

95. The EC first argues that certain technology researched under the HSR Program is applicable to subsonic flight and that, therefore, hypersonic research is applicable to subsonic aircraft. What the EC fails to recognize is that the HSR Program dealt primarily with *super*sonic flight,[175] which presents a set of physical conditions different from hypersonic flight.[176] The subsonic, supersonic, and hypersonic regimes are so different that NASA maintains different sets of test facilities for experiments in each,[177] with hypersonic wind tunnel usage limited to government entities, with no commercial use.[178] Thus, assertions about technologies developed under the HSR Program indicate nothing about the technologies that might arise from hypersonic flight research. Boeing has also explained that it did not use the results of research under the HSR Program in the technologies incorporated in the 787.[179]

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[173] Exhibit EC-1176, p. 29.

[174] Exhibit EC-25, p. 10, note 2; p. 11, note 2; and p. 19.

[175] The HSR program did fund one Boeing contract, NAS1-20013, that included research into hypersonic flight. However, that research involved materials for airframe structures – exactly the kind of research that even CRA recognizes as unrelated to large civil aircraft. US RPQ 334(b), para. 69, note 90; Exhibit EC-1176, p. 29. The contract also emphasized the great difference in physical conditions characteristic of hypersonic and supersonic vehicles. US RPQ 334(b), para. 69, note 90

[176] *E.g.*, US RPQ 334(b), para. 69, note 90.

[177] *E.g.*, RAND, National Defense Institute, *Wind Tunnel and Propulsion Test Facilities, Supporting Analysis to an Assessment of NASA's Capabilities to Serve National Needs*, p. 8 (2004) (Exhibit US-116).

[178] RAND, National Defense Institute, *Wind Tunnel and Propulsion Test Facilities, Supporting Analysis to an Assessment of NASA's Capabilities to Serve National Needs*, p. 21 (2004) (Exhibit US-116).

[179] Affidavit of Douglas N. Ball, paras. 6 and 9-11; US FWS, para. 1128.

96. The EC also defends inclusion of hypersonic research on the basis of two press releases describing NASA work on "LoFLYTE", a prototype aircraft built by Accurate Automation Corporation to serve as a "technology testbed for many emerging aerospace technologies with initial emphasis on neural network controls."[180] The EC correctly notes that NASA tested the aircraft in 1996 and 1997, expressed enthusiasm about future military and commercial uses of the neural networks technology, and predicted that it would have application in subsonic, supersonic, and hypersonic aircraft.[181] But what the EC fails to understand is that just because something is tested on a hypersonic aircraft does not make it "hypersonic" research. When NASA uses that term, it means research into flight at hypersonic speeds. (LoFLYTE was, in fact, a prototype incapable of hypersonic flight.[182]) The examples provided by the United States of hypersonic research improperly included in the EC estimates were all related to *flight* at hypersonic speeds.[183] The neural net applications tested on LoFLYTE would not fall into this category.[184]

97. As noted in the introduction to the U.S. comment on Question 335, the EC also errs in its assertion that it can treat the entirety of a research project as a subsidy to large civil aircraft if it shows that "some" of that the research "could" have application on large civil aircraft. The EC's response to this part of the question fails to show even that "some" research into hypersonic flight is applicable to large civil aircraft. It also fails to provide any evidence that research on hypersonic flight conferred a benefit on Boeing's production or development of large civil aircraft. Therefore, the EC has failed to meet its burden of proof with respect to both the law and the facts.

(b) That the European Communities has inappropriately treated rotorcraft research as generally applicable to LCA (US Comments on EC RPQ 164, para. 257);

98. The EC similarly has not demonstrated that rotorcraft research should be included in its claims. In response to this question about the applicability of rotorcraft research to large civil aircraft, the EC concedes that "there are several areas of technology that differ between the two vehicles."[185] However, it attempts to defend its treatment of *all* rotorcraft research as applicable

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[180] "NASA's LoFLYTE Program Flown" (Exhibit EC-1420).

[181] Flight Tests of the Low Speed Characteristics of a Hypersonic Waverider Configuration (Exhibit EC-1421).

[182] "NASA's LoFLYTE Program Flown," p. 4 (Exhibit EC-1420).

[183] *Examples of hypersonic research under R&T Base Program components that the EC included in its estimate* (Exhibit US-1272, pp. 5-6).

[184] In fact, NASA's neural net experiments in 1997 are referenced in the 1998 R&T Base Program budget estimates without any mention of hypersonic flight. R&T Base Program 1998 Budget Estimate, p. SAT 4.1-7 (Exhibit EC-398, p. 99/270 ("Complete initial flight evaluation of neutral-network flight controls. Demonstrate capability to identify key aircraft parameters in flight using a neural-net flight controller.").

[185] EC RPQ 335(b), para. 90.

to large civil aircraft by contending that there are also several areas of overlap. The evidence to which it refers does not justify this conclusion.

99. The EC begins by citing a passage from the text of Dr. Daniel Raymer's aircraft design textbook stating that his subchapter on rotorcraft will discuss "how their design differs from *and is similar to the design of other types of aircraft* as discussed in this book."[186] The EC accuses the United States of improperly failing to reference this statement. However, it is the EC that errs. Dr. Raymer devotes most of his 11-page analysis to a discussion of how to design and configure rotor blades – a topic clearly irrelevant to large civil aircraft, which do not use rotors. His analysis of rotorcraft design identifies only three "similarities" with other types of aircraft:

- "power loading is identical to that of propeller-powered fixed-wing aircraft";
- "{d}isk loading (W/A) is the equivalent of wing loading for a fixed-wing aircraft;" and
- "{a}irfoil selection for a helicopter rotor blade is similar to the selection of wing airfoils, but has several key differences. . . . Unfortunately, many of the airfoils that are 'good' for wings in terms of maximum lift or shock-delaying characteristics are not good for rotors because their shape creates an excessive pitching moment."[187]

Similarities to propeller-driven aircraft are obviously irrelevant in considering applicability of rotorcraft research to large civil aircraft, which are propelled by jet engines. The reference to disk loading being "equivalent" to wing loading refers only to the fact that both loading ratios measure the lift generated by the airfoil, which is the wing on a fixed wing aircraft and the blade on a rotary aircraft. However, for a fixed wing aircraft, wing loading refers to the lift generated over the physical area of the wing as it moves laterally through still air. For a rotorcraft, disk loading refers to a different physical parameter – the lift generated by rotation through turbulent air. The mechanical differences in generation of lift drive differences in the aerodynamic conditions for which airfoils are chosen, which is why the third "similarity" identified by Dr. Raymer – airfoil selection – is in application subject to "key differences." As a result, "many of the airfoils that are 'good' for wings in terms of maximum lift or shock-delaying characteristics are not good for rotors because their shape creates an excessive pitching moment."[188] (Hence Dr. Raymer's recommendation that "{s}pecialized helicopter textbooks should be referred to for the details of blade aerodynamics, rotor analysis, power estimation, vehicle dynamics, and range and performance analysis."[189]) In short, the "similarities" referenced by Dr. Raymer have little

[186] EC RPQ 335(b), para. 90.

[187] Daniel Raymer, *Aircraft Design: A Conceptual Approach*, pp. 647-648 (3rd edition, 1999) (Exhibit US-1283).

[188] *Compare* Raymer, *Aircraft Design*, pp. 87-88 *with* pp. 647-648.

[189] Raymer, *Aircraft Design*, p. 639.

bearing on jet-driven large civil aircraft, to the point at which his detailed text on the design of fixed wing aircraft is insufficient for designing rotorcraft.

100. The EC also asserts that it has provided "extensive evidence" that the fuselage for the 787 derives in "significant part" from research conducted under DoD's V-22 rotorcraft program.[190] The only "evidence" it cites is scarcely "extensive," as it consists of six slides from a presentation prepared by four Airbus engineers.[191] These present a set of pictures, with almost no text, that make a few superficial comparisons between the V-22 and 787. Michael Bair, who led the development of the 787, explained that technologies used on the V-22 "have not been applicable" to the 787 because they "used composites optimized to meet a very different set of requirements ('allowables')."[192] In any event, the EC's allegations about DoD's research on helicopter fuselages indicate nothing about NASA's research and, therefore, do not justify inclusion of NASA's rotorcraft programs.

101. As noted in the introduction to the U.S. comment on Question 335, the EC errs in its assertion that it can treat the entirety of a research project as a subsidy to large civil aircraft if it shows that "some" of that the research "could" have application on large civil aircraft. The EC's response to this part fails to provide any evidence that research on rotorcraft conferred a benefit on Boeing's production or development of large civil aircraft. Therefore, it has failed to meet its burden of proof with respect to both the law and the facts.

> *(c) That the European Communities has provided no evidence indicating that the research NASA conducts on how to operate unmanned vehicles has anything to do with LCA (US Comments on EC RPQ 164, para. 257);*

102. The EC has not demonstrated that research on unmanned air vehicles ("UAVs") should be included in its claim. In its response to this part of the question, the EC concedes that "more specialized unmanned vehicle technologies may not be applicable to LCA."[193] However, it returns again to its old observation that the "fundamental laws of physics and engineering principles" apply to large civil aircraft and unmanned vehicles. It then asserts a number of potential similarities it perceives between large civil aircraft and unmanned vehicles. But the only evidence it provides to support these assertions is an article about crash-avoidance technology NASA has tested in unmanned air vehicles ("UAV"s).

103. The EC never explains how crash avoidance technology is a benefit – in the sense of Article 1.1(b) of the SCM Agreement – to civil aircraft producers in general, or Boeing in

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[190] EC RQ 335(b), para. 91.

[191] EC RPQ 335(b), para. 91, *citing* Tim Sommers Composites Presentation, slides 57-623 (Exhibit EC-14) (BCI).

[192] Affidavit of Michael Bair, para. 27 (Exhibit US-7).

[193] EC RPQ 335(c), para. 93.

particular. The article makes clear that the research used commercially available equipment made by Goodrich, which was installed on existing aircraft.[194] Thus, if this research conferred any "benefit" in civil aviation, it would accrue to Goodrich, which could then sell at market prices to Airbus, Boeing, or airlines that fly Airbus aircraft.[195] Another UAV projected described in the article was an effort by Lockheed Martin, Boeing, Saab, AFRL, and the Swedish Air Force "to develop an automatic Air Collision Avoidance System (ACAS) that also could one day prevent midair collisions between manned and unmanned vehicles by tracking their direction and trajectories."[196] Thus, the focus of this NASA "UAV" research is clearly on air traffic control, and trying to keep civil aircraft (and their passengers) safe *from* UAVs. Thus, they would confer no benefit on Boeing. Moreover, the existence of research involving non-U.S. companies and a non-U.S. air force scarcely supports an assertion that UAV research benefits only U.S. producers of civil aircraft.

104. The United States notes that the article cited in the EC's response to this question is the first evidence the EC has put forward in three years of this proceeding to support its inclusion of unmanned aircraft research in a calculation of financial contribution and benefits to civil aircraft. As it does not demonstrate any financial contribution or benefit to *Boeing*, it provides no support for the EC's methodology.

105. As noted in the introduction to the U.S. comment on Question 335, the EC errs in its assertion that it can treat the entirety of a research project as a subsidy to large civil aircraft if it shows that "some" of that the research "could" have application on large civil aircraft. The EC's response to this part of the question fails to provide any evidence that research on unmanned vehicles conferred a benefit on Boeing's production or development of large civil aircraft. Therefore, it has failed to meet its burden of proof with respect to both the law and the facts.

(d) That the European Communities has ignored evidence identified by the United States at the second Panel meeting (US, SNCOS, para. 62), showing that NASA conducted air traffic management and safety research under the Aviation Safety and Security Programme (US Comments on EC RPQ 164, para. 258);

(e) That the European Communities has failed to exclude from its estimate of the value of the challenged programmes the examples of research into air traffic management, hypersonic aircraft and safety that the United States identified in its RPQ 176 and in Exhibit US-1272 (US Comments on EC RPQ 164, para. 258);

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[194] Ramon Lopez, "Avoiding Collisions in the Age of UAVs," Aerospace America, June 2002 (Exhibit EC-1422).

[195] Goodrich is, in fact, an Airbus supplier. Affidavit of Michael Bair, para. 36 (Exhibit US-7).

[196] Ramon Lopez, "Avoiding Collisions in the Age of UAVs," Aerospace America, June 2002 (Exhibit EC-1422)

106. The EC provides no basis to conclude that air traffic management and safety research fall within its claims. The EC's joint response to parts (d) and (e) relies on its "*some* of the research *could* be applied to large civil aircraft" standard to defend the inclusion of research into air traffic management, safety, and hypersonic flight in its estimate of the magnitude of the subsidy to Boeing. In the introduction to this comment, the United States explained that such a showing would not meet the burden of proof for the EC's subsidy magnitude calculation, namely, to identify the size of the benefit from subsidies that *actually did benefit* Boeing. Thus, from the outset, the EC argument fails as a legal matter. As a factual matter, the EC fails to present any evidence that the air traffic management, hypersonic flight, and safety research identified by the United States resulted in a benefit to Boeing.

107. Before launching a point-by-point refutation of the EC's response to these parts of the question, it is useful to observe that the EC's arguments rely on the asymmetric burden of proof that it seeks to impose on this proceeding.[197] The EC reveals this imbalance in stark terms when it criticizes the United States on the grounds that:

> The US examples consist of a series of quotes taken from the same NASA budgets utilised by the European Communities in deriving its estimates, and no actual detailed evidence as to precisely what research was conducted under these headings, or how much was spent on such research.[198]

Statements of a similar nature appear throughout the response to this part of the question.[199] The EC recognizes that the United States cited the same material on which the EC based its estimate, but insists without explanation that evidence contrary to its views must be disregarded unless that evidence is more "detailed" or "precise" than the material cited by the EC. Thus, this passage outlines exactly the type of "double standard of proof," condemned by the Appellate Body in *US – Cotton Subsidies (Article 21.5)(AB)*.[200]

108. The EC also repeatedly criticizes the United States for not putting forward evidence of the value of the research that the EC has erroneously included in its estimate of the magnitude of the alleged subsidy to Boeing.[201] As the responding party, the United States bears only the burden of rebutting the assertions put forward by the EC. It can do this by showing that the evidence adduced or legal arguments made by the EC fail to create a presumption that its assertions are true. The United States has, in fact, demonstrated that the EC failed to establish

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[197] The U.S. comment on the EC response to Question 324 elaborates further on this point.

[198] EC RPQ 335(d)&(e), para. 98.

[199] EC RPQ 335(d)&(e), paras. 102, 106, and 108.

[200] *US – Cotton Subsidies (21.5)*, para. 293, *quoting Korea – Alcoholic Beverages (AB)*, para. 164 (describing a "dual standard of proof" as "one standard, relaxed and permissive, for the complainants, and another, very strict and demanding, for the defending party.").

[201] EC RPQ 335(d)&(e), paras. 100, 102, 105, and 110.

that all of the research included in its estimate of the value of alleged subsidies to Boeing actually conferred a benefit on Boeing or was even related to large civil aircraft. A responding party can also rebut the complaining party by presenting additional evidence demonstrating that what actually occurred is different from the situation portrayed by the complaining party. The United States has done this by demonstrating that the maximum value of NASA's contracts with Boeing for aeronautics research was $775 million, and the value of goods and services provided under Space Act Agreements was $75 million – a fraction of the amounts alleged by the EC. The United States showed further that other facilities, equipment, and employees related to contracts play no role in estimating subsidy magnitude because they are not "provided" to the contractor within the meaning of Article 1.1(a)(1)(iii), and that NASA employees do not provide services to contractors outside of Space Act Agreements. However, as a responding party, the United States does not bear the burden of attempting to fix these and other errors it has identified in the complaining party's arguments.

109. **Air traffic management and safety research.** The EC criticizes the United States for quoting what it describes as "four snippets" showing that the NASA's Aviation *Safety* Program did just what its name indicates – work on improving the safety of air transportation, including improvements to air traffic management systems. It is telling in this regard that the EC has *never* put forward evidence that research under this program benefited the production or development of large civil aircraft. Its first written submission simply describes six safety technologies[202] and, without bothering to explain why, declares that they were a financial contribution and conferred a benefit to Boeing.[203] Thus, any evidence at all would outweigh what the EC has adduced, namely, nothing.

110. The EC attempts to defend its treatment of the Aviation Safety Program by arguing that the examples of air traffic management and safety research under that program "are so generic that they do not lead to a conclusion that the technology being researched here is technology for specific use in the air traffic system, rather than use on LCA."[204] It then asserts that research to reduce accidents "may" have involved "systems on board LCA" or "crash-resistant structures or materials with improved burn-through performance."[205] As the United States discussed in the introduction to this section, the use of equipment *on* large civil aircraft does not mean that there was a benefit to Boeing. This is especially true with safety and air traffic management, as NASA

[202] EC FWS, paras. 597-602 (synthetic vision systems, aviation system monitoring and modeling, system-wide accident prevention, single aircraft accident prevention, weather accident prevention, and accident mitigation). The EC does assert that the 787 incorporates synthetic vision technology. EC FWS, para. 597. However, the head of development of the 787, Michael Bair, has explained that Boeing used only technologies generated by itself and its commercial suppliers in the 787. Statement of Michael Bair, paras. 7, 33, and 41-42 (as a computerized navigational tool, synthetic vision would be one of the avionics technologies from a supplier on which Boeing relied) (Exhibit US-7).

[203] EC FWS, paras. 603-607.

[204] EC RPQ 335(d)&(e), para. 108.

[205] EC RPQ 335(d)&(e), para. 108.

particularly emphasizes the importance of making such technologies broadly available.[206] In fact, two cooperative agreements funded through the Aviation Safety Program provide examples of how wrong the EC is. Cooperative Agreement NCC-1-287 provided for a weather information technology to allow *pilots* to make better decisions to avoid weather-related incidents. NCC-1-343 created a database for use by aircraft flying during difficult weather conditions.[207] These technologies would certainly benefit airlines and the people who fly in aircraft, but not in the sense of Article 1.1(b) of the SCM Agreement. They provide no benefit – whether used on airplanes or in control towers – to Boeing's production or development of large civil aircraft because they relate to the *use* of aircraft, and not their production or development.[208]

111. Thus, the EC has put forward no evidence to establish that the Aviation Safety Program conferred a benefit on Boeing's production or development of large civil aircraft. The available evidence uniformly demonstrates that the program related exclusively to safety and air traffic management, research that even the EC concedes confers no benefit on Boeing.[209]

112. The EC attempts a similar argument regarding examples of air traffic management and safety research under the R&T Base Program. It contends that the evidence "do{es} not suggest that the research at issue was wholly unrelated to LCA."[210] This is, of course, a nonsensical standard because all air traffic management and safety research "relates" to large civil aircraft by keeping them from colliding with each other or killing people when they hit the ground. By that standard, *all* air traffic management and safety research would be covered by the EC claims, which even the EC recognizes is wrong. The critical point is not whether research "relates" to large civil aircraft, but whether NASA research confers a benefit on Boeing large civil aircraft production. The EC's arguments do not show that the examples cited by the United States resulted in a benefit to Boeing.

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[206] With regard to one safety technology, the NASA administrator testified that the "payoff" for NASA was that "{t}here are now 4,000 aircraft worldwide using this technology." 2001 Senate Aeronautics Hearing, p. 9 (Exhibit EC-292). One of the cooperative agreements funded through the Aviation Safety Program states "{t}he second component (Phase II) would be a more global review of user requirements coupled with a discussion of the Operational Concepts developed by NASA internally describing how they could actually be implemented nationally and internationally." Agreement NCC1-343, p. 25 (Exhibit US-597(HSBI)). Germany-based Lufhansa was one of the airlines that participated in the research conducted by NASA under this program. *Ibid.*

[207] US RPQ 328, para. 38, note 55. NCC-1-287 and NCC-1-343 were both funded through the Aviation Safety Program. *Maximum value of Boeing contracts related to EC-challenged R&D*, p. 2 (Exhibit US-1305).

[208] Agreement NCC-1-343 specifically describes airlines as users of the database and equipment the program sought to develop. Agreement NCC-1-343, p. 25 (Exhibit US-597). American Airlines, Alaska Air, and Luthansa were listed as "user/airlines" that would evaluate the results of the research. *Ibid.*

[209] The Panel should also note that the value of Boeing contracts funded through this program, $19.6 million, represents less than 3 percent of the $844 million in NASA funding of this program alleged by the EC. *Maximum value of Boeing contracts related to EC-challenged R&D*, p. 2 (Exhibit US-1305); Exhibit EC-25, p. 15.

[210] EC RPQ 335(d)&(e), para. 109.

113. For example, it is true that the database of tailplane aerodynamics to assess behavior in icing conditions is "unambiguously related to LCA."[211] That does not mean that it benefits large civil aircraft *production* or *development*. In fact, that type of data is of critical value to the *users* of aircraft, including those who use Airbus aircraft.[212] Similarly, on-board equipment for integrating aircraft into the National Airspace System is "related" to large civil aircraft. However, users of Airbus aircraft must also have this type of equipment if they are going to avoid colliding with other aircraft, buildings, or terrain – a critical goal of U.S. safety regulators without regard to the manufacturer of the aircraft.

114. The EC also asserts that computer models of aircraft encounters with wake vortexes produce data useful for designing large civil aircraft. However, the EC neglects to mention that under the research identified by the United States, "critical wake-vortex hazard-relationship data and expertise were provided to the National Transportation Safety Board (NTSB), the FAA, and industry to support their assessment of recent accidents."[213] Although the NASA budget documents do not specify which "industry" received the wake vortex data, other evidence before the Panel shows that Airbus and European regulators had access.[214]

115. The EC asserts that a NASA program under which "{k}ey connections with operational ground facilities and airlines for real-time aircraft performance data have been completed" would have resulted in data "which is used on LCA for aircraft health management."[215] It does not explain the basis for this conclusion, but the fact that the data is communicated to "airlines" means that it is just as likely to go to Airbus as to Boeing. NASA's description of the research makes this point clear:

> A model of human memory constraints in procedure execution and reactive planning will be developed. This model will be used to guide design of automation to aid air traffic service providers, airline operations center personnel and flight crews to assure automation support consistent with human performance characteristics.[216]

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[211] EC RPQ 335(d)&(e), para. 109.

[212] NASA performed tests on the Airbus A319 and A320, among other aircraft, to evaluate how they performed in a variety of icy landing conditions. Joseph R. Chambers, Concept to Reality: Contributions of the NASA Langley Research Center to U.S. Civil Aircraft of the 1990s (2003) (Exhibit EC-293).

[213] R&T Base Program Budget Estimate for FY 1998, p. SAT 4.1-10 (Exhibit EC-398, p. 105/270).

[214] NASA and FAA officials participated in the Wakenet2 – Europe Conference with Airbus employees and officials from European aeronautics research and regulatory entities. Participants discussed wake vortex data from U.S. and European sources, and concluded with a session on wake vortex assessments for the A380, led off by an overview presentation by an FAA official. Final Programme: Wake Turbulence (Exhibit US-72).

[215] R&T Base Program Budget Estimate for FY 2000, p. SAT 4.1-11 – 4.1-12 (Exhibit EC-398, pp. 139-140/270); EC RPQ 335(d)&(e), para. 109.

[216] R&T Base Program Budget Estimate for FY 2001 (Exhibit EC-398, p. 163/270).

116. In short, the EC's discussion of air traffic management and safety research under the R&T Base Program does nothing to rebut the conclusion that this research conferred no benefit on Boeing within the meaning of Article 1.1(b). Thus, like the other air traffic management research excluded by the EC, it has no place in a calculation of the magnitude of alleged subsidies that benefited Boeing.

117. **Hypersonic flight.** The EC argues that research "related" to large civil aircraft "may" have occurred in projects devoted to hypersonic flight.[217] The introduction to the U.S. comment on this part of the question explains that even if the EC could prove such a tenuous and uncertain relationship, it would not satisfy its burden of proof to show an actual financial contribution and benefit to Boeing. In addition, as a factual matter, the evidence does not demonstrate that NASA's hypersonic flight research was "related" to large civil aircraft in any way, let alone that such programs conferred a benefit on Boeing.

118. The United States identified several areas of hypersonic research in the R&T Base Program. The EC notes correctly that some of the research projects "relate to the modeling of aerodynamic flow." It then seeks to create a relationship with large civil aircraft by asserting that such modeling "is applicable to the design of any aircraft, including LCA."[218] However, what the EC fails to appreciate is that air behaves differently at subsonic, transonic, supersonic, and hypersonic speeds. That is why NASA has different test facilities for these different speeds.[219] It is also the reason why airlines cannot shorten their flight times by running the engines fast enough to go beyond the speed of sound – transonic and supersonic (let alone hypersonic) speeds create different physical conditions in which a large civil aircraft cannot function. As Dr. Raymer explains, "{a}t transonic and supersonic speeds, the maximum lift a wing can achieve is usually limited by structural considerations rather than aerodynamics. Unless the aircraft is flying at a very high altitude, the available maximum lift at Mach 1 is usually enough to break the wings off!"[220] The equations that model key performance parameters at speeds above Mach 1 do not even function at speeds below Mach 1.[221] Thus, while an engineer might use any number of "models" to design different types of aircraft, an aerodynamic flow model for hypersonic speeds would not be useful to design a subsonic aircraft. For the same reasons, a CFD code applicable to hypersonic flight conditions would not be applicable to subsonic conditions.

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[217] EC RPQ 335(d)&(e), para. 99.

[218] EC RPQ 335(d)&(e), para. 99.

[219] RAND, National Defense Institute, *Wind Tunnel and Propulsion Test Facilities, Supporting Analysis to an Assessment of NASA's Capabilities to Serve National Needs*, p. 8 (2004).

[220] Daniel Raymer, *Aircraft Design: A Conceptual Approach*, p. 331 (3rd edition, 1999) (Exhibit US-1283).

[221] Daniel Raymer, *Aircraft Design: A Conceptual Approach*, p. 323 (3rd edition, 1999) (Exhibit US-1283).

119. In short, the EC has failed even to show that research into hypersonic flight "may" be "related" to large civil aircraft, or that such research conferred a benefit on Boeing. Therefore, in addition to the legal failings of its argument, it has failed to adduce facts that would support treating hypersonic flight research as applicable to large civil aircraft.

120. **Rotorcraft.** Although the Panel's question did not ask the EC to address rotorcraft, it did so anyway. Its extraneous discussion does nothing to support its erroneous treatment of all rotorcraft research as applicable to large civil aircraft.

121. The EC first cross-references its response to Question 335(b). The United States showed in its comment on that response that the EC had failed to identify any evidence that would justify treating all rotorcraft research as applicable to fixed wing aircraft, such as large civil aircraft. As the United States explained, the physics and mechanics of rotorcraft flight are different from those for a jet aircraft. Thus, the fact that NASA's research into rotorcraft involved "product process development", "avionics", "noise reduction technologies", and "basic physics and design" does not make that research "equally applicable to LCA," as the EC asserts.[222] Rather, the differences between rotorcraft and large civil aircraft support a presumption that research on one does not generally apply to the other.

122. The EC notes that NASA specifically references a few projects researching materials as applicable to both fixed wing aircraft and rotorcraft.[223] However, the EC misunderstands the significance of these statements. First, they are at a high level of generality, as witnessed by the materials research program cited by the EC that conducted:

> research for the development and application of advanced materials and structures technologies to reduce manufacturing cost and structural weight, enhance performance, reduce noise, insure safety, reliability, and durability and reduce development cycle time for future rotorcraft and aircraft airframe *and propulsion systems*.[224]

The EC has never argued that materials for constructing engines are related to those used for constructing large civil aircraft. In fact, it has consistently, and correctly, treated engine research as inapplicable to airframe research. Thus, the inclusion of rotorcraft in this list does not make research on rotorcraft applicable to large civil aircraft, any more than inclusion of engines and aircraft in that same list would make research on one applicable to the other.

123. The EC also notes that this materials research calls for "coordination between NASA fixed wing and rotorcraft programs and Army research programs, and well as industry

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[222] EC RPQ 335(d)&(e), para. 104.

[223] EC RPQ 335(d)&(e), para. 104.

[224] EC RPQ 335(d)&(e), para. 104, *quoting* NASA R&T Base Program Budget Estimates for FY 1996, pp. SAT 4-6 – SAT 4-7 (Exhibit EC-398, pp. 70-71/270) (emphasis added).

partnerships and cost-sharing programs."[225] However, the use of "between" suggests that there were two parties to the cooperation, and that the NASA fixed wing and rotorcraft programs each cooperated with the Army, rather than with each other. Had NASA meant to indicate that the NASA fixed wing, NASA rotorcraft, and the Army were working collectively, it would have referred to coordination *among* the three. Thus, the EC has failed to show that rotorcraft research "may" be "related" to large civil aircraft, or that such research conferred a benefit on Boeing. Therefore, in addition to the legal failings of its argument, it has failed to adduce facts that would support treating hypersonic flight research as applicable to large civil aircraft.

124. **Unmanned vehicles.** Although the Panel's question did not ask the EC to address unmanned vehicles, it included a paragraph anyway. That paragraph, however, provides no analysis of the facts. It merely states the EC's argument that the Panel should apply an asymmetric burden of proof, and then ends by noting that the United States has not provided a value for the additional research funding that must be excluded. As noted in the introduction to this comment, that burden does not fall on the United States. And, as the EC's evidence does not demonstrate that any amount of UAV research is a subsidy to large civil aircraft, it has not made a *prima facie* case for including that research in its claim.

125. **Conclusion.** As noted in the introduction to the U.S. comment on Question 335, the EC errs in its assertion that it can treat the entirety of a research project as a subsidy to large civil aircraft if it shows that "some" of that the research "could" have application on large civil aircraft. The EC's response to parts (d) and (e) of the question fails to provide any evidence that research on air traffic management, safety, hypersonic flight, rotorcraft, or unmanned vehicles conferred a benefit on Boeing's production or development of large civil aircraft. Therefore, it has failed to meet its burden of proof with respect to both the law and the facts.

> *(f) That the European Communities has failed to exclude from its estimate numerous examples of engine-related research conducted under components of the R&T Base programme (identified in US RPQ 176) which the European Communities inappropriately treated as applicable only to civil aircraft (US Comments on EC RPQ 164, para. 259);*

126. The EC response to this part does not address the substance of the U.S. evidence, which cited examples of engine research funded under the R&T Base Program that the EC did not exclude from its estimate. The EC notes that one of the examples indicated that "{r}esearch into materials is directed toward airframes and high-performance gas turbine engines," and asserts that this "does not relate to engine-specific research."[226] The EC does not explain the basis for this characterization and, in fact, there is none. The logical implication of NASA's statement is

[225] EC RPQ 335(d)&(e), para. 104, *quoting* NASA R&T Base Program Budget Estimates for FY 1996, pp. SAT 4-6 – SAT 4-7 (Exhibit EC-398, pp. 70-71/270).

[226] EC RPQ 335(f), para. 114, *quoting* NASA R&T Base Program Budget Estimate for FY 1991, p. RD 12-14 (Exhibit EC-398, p. 12/270).

that a single program is funding research into both airframe materials and engine materials. That does not mean that the research into engine materials is less engine-specific than all the other engine research that the EC excluded. The EC does not even address the other examples of engine research conducted under the R&T Base Program, which clearly apply exclusively to engines.

127. The EC then turns to the erroneous argument that it used repeatedly in response to Question 335(d)&(e), that the United States has not provided a value for the additional research funding that must be excluded. As noted in the introduction to the U.S. comment on the EC response to Question 335(d)&(e), that burden does not fall on the United States. These examples demonstrate that the EC's alleged subsidy magnitude calculation includes research that conferred no benefit to Boeing. Thus, the EC has failed to meet its burden of proof.

> *(g) That the European Communities' methodology allocates subsidies to components twice; once over their value as produced by their original manufacturers, and once to their value as included in Boeing aircraft, the result of which is to under-allocate alleged subsidies to component manufacturers, and therefore to over-allocate alleged subsidies to Boeing (and to treat the alleged subsidy as* both *a benefit to the recipient* and *a benefit passed through to the downstream user, an assumption which finds no support in the SCM Agreement) (US, Comment on EC RPQ 164, para. 260 and footnote 438);*

128. Nothing in the EC response to this question withstands scrutiny – not its calculation, not the methodology underlying the calculation, not the reasons for relying on that methodology, and not the facts as described by the EC. The methodology is the EC's flawed "top down" approach to estimating the magnitude of the subsidies allegedly conferred on Boeing, specifically the over attribution to Boeing because the EC's calculation double counts components. The EC, as it frequently does, begins not with an answer to the Panel's question, but with an effort to blame the United States for the flaw in the EC's alleged subsidy magnitude calculation. The EC asserts that it was forced to adopt its form of "top down" methodology because the United States did not provide "complete and unredacted copies of all contracts and subcontracts, and related documentation, with Boeing/MD under the NASA programmes at issue, plus a detailed explanation of how the funds under those programmes are spent by NASA."[227]

129. This all-purpose excuse is contrary to the evidence. The Panel already has the vast majority of NASA's contracts with Boeing funded under the challenged programs, [228] and the EC has never explained how having more would change anything in the assessment of the EC claims. The Panel has reliable *real* figures on the maximum amount that Boeing could have received under aeronautics research contracts.[229] It has documents and data on NASA's

[227] EC RPQ 335(g), para. 118.

[228] US RPQ188, para. 225 (84.5 percent of contracts by value have been submitted to the Panel).

[229] US RPQ 188, para. 223.

provisions of goods and services to Boeing under Space Act Agreements.[230] It has, in the form of contracts and contract modifications, information on equipment available to Boeing under NASA's contracts.[231] It has information on how much NASA paid other contractors for research services, and who those contractors were.[232] And finally, it has an explanation of how NASA spent funds under those programs – it paid other contractors to perform research, under the same laws, regulations, and standard contract clauses that apply to Boeing.[233] The Panel also has evidence of the results of this work in the form of NASA's huge database of reports and other research results.[234]

130. The problem facing the EC is that all of this evidence shows that NASA (1) purchased research services from Boeing to a far smaller extent than the EC alleges; (2) paid no more than adequate remuneration for the services it received, which were valuable to itself and to the broader scientific community; (3) conducted research too foundational in nature and too widely disseminated to afford Boeing any competitive advantage; and (4) did not provide goods and services to Boeing in any meaningful amount, and received adequate remuneration for what it provided.

131. Rather than trying to address this immense body of evidence contrary to its claims, the EC has sought to dispose of it. When the United States provided the bulk of this evidence in the Annex V process in DS317, which included the EC's original challenge of NASA, the EC ceased to pursue the dispute and requested establishment of a new panel.[235] When the United States sought to make the information before the DS317 panel available to this Panel, the EC refused to cooperate.[236] When the United States submitted the evidence with its first written submission,

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[230] Exhibit US-74; *Value of NASA Facilities, Equipment, and Employees Under Selected Space Act Agreements* (Exhibit US-1256(revised)); *Data on the estimated price reports taken from NASA's TechTrackS system* (Exhibit US-1347(BCI); Exhibits US-499, US-500, US-501, US-502, US-503, US-504, US-505, US-506, US-507, US-508, US-509, US-511, US-512, US-513, US-514, US-515, US-516, US-517, US-518, US-519, US-520, US-521, US-522, US-523, US-524, US-525, US-526, US-527, and US-528.

[231] *E.g.*, *List of Government-furnished property under Contract NAS1-20546* (Exhibit US-1334).

[232] US RPQ 175, para. 159; US RPQ 159, para. 148; *NASA Spending Under VSP and QAT Programs* (Exhibit US-1255).

[233] US FWS, paras. 226-228; US RPQ 186, para. 204; US Comment on EC RPQ 166, para. 266; US RPQ 343, para. 131; US RPQ 362(b), para. 192.

[234] FWS, para. 209; US SWS, para. 64.

[235] Response of the United States to the Request for Preliminary Rulings of the European Communities, paras. 13-14 (March 22, 2007).

[236] Letter from the EC to the Panel, p. 2 (March 5, 2007); Letter from the United States to the Panel, p. 3 (March 7, 2007).

the EC simply ignored it.[237] And, when the United States verified that information in multiple ways, the EC simply declared the exercise void of credibility.[238]

132. In the place of evidence as to what NASA actually paid and provided, the EC proposes its "top down" methodology, which relies on a set of assumptions to derive an estimated subsidy magnitude vastly in excess of the value of what NASA actually paid to Boeing for research services or provided in the form of goods and services. Contrary to the EC's assertions, however, nothing in the publicly available information compels it to use this methodology or this result. In fact, even if the United States had submitted nothing to the Panel, the publicly available evidence shows that the EC's "top down" methodology is neither necessary nor the "best available evidence":

- the results of NASA research are widely available, and useful to all types of aircraft and to the users of aircraft in the airline industry and, therefore, are not limited to the producers of civil aircraft and parts;[239]

- the EC's methodology treated research into air traffic management, hypersonic flight, and engines as applicable only to civil aircraft even though the EC concedes that these topics are not applicable to civil aircraft;[240]

- the EC's methodology treated rotorcraft and unmanned aircraft research as applicable to large civil aircraft, even though they are not;[241]

- the EC's methodology undercounts the value of aircraft components and parts produced in the United States and thereby exaggerates the value of NASA funding relevant to Boeing;[242] and

- all of these problems could be easily avoided by dropping the impossible task of subtracting all of the non-aircraft research from the NASA budget, and instead

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[237] EC RPQ 316(b), paras. 5-6.

[238] EC Comment on US RPQ 188, paras. 201-207.

[239] FWS, paras. 193 and 207-210; US SWS, para. 64; US RPQ 159, para. 148; *List of OVERFLOW Users* (Exhibit US-1270); *List of publications based on work performed in the Integrated Wing Design ("IWD") project* (Exhibit US-1140(revised)); *Reports and articles published by Boeing/McDonnell personnel pursuant to aeronautics research contracts* (Exhibit US-1253).

[240] US Comment on EC RPQ 164, paras. 258-259; US RPQ 344, paras. 146-148; *R&T Base Program Research Projects Erroneously Included in the EC Estimate of Non-Engine-LCA-Related Research* (Exhibit US-1272).

[241] US RPQ 208(e), para. 306; US Comment on EC RPQ 335(b).

[242] US FWS, para. 207; US Comment on EC RPQ 164, para. 260; US RPQ 343, paras. 138-139; US Comment on EC RQ 335(g), *infra*.

> expanding the pool of companies treated as involved in NASA research and making other adjustments to the calculations.[243]

The flaws in the EC's approach were obvious from the materials on which it relied, and the "limitations" it alleges in the available information did not necessitate the methodology it chose. There were alternatives, some of which the United States outlines in its responses to Questions 343 and 351.[244] The evidence neither necessitates nor supports the choices made by the EC, and the EC has never provided any justification other than asserting that its assumptions represented the "best information available." It is noteworthy, however, that at each step, the EC chose the approach that, without any basis in the facts, increased the amount of NASA funding allocated to Boeing.

133. The EC makes a brief attempt to justify its failure to take full account of the role of aircraft component manufacturers by asserting that "many component manufacturers do not conduct significant R&D."[245] The only support it provides for this statement is a citation to the declaration of four Airbus engineers, who state that "Boeing engineers leveraged in-house knowledge and experience to yield an optimum design of the wing, *before* outsourcing non-critical detailed design and manufacturing tasks to its suppliers."[246] This statement, which the engineers based on a newspaper article rather than any professional knowledge, says *nothing* about whether suppliers conduct their own research.

134. The evidence shows that, in fact, Boeing's suppliers do conduct research that is critical to their core competencies. Michael Bair, who oversaw development of the 787, explains:

> We have been able to draw on technologies available from suppliers for much of the aircraft, including avionics and landing gear. Some of these technologies have been developed by suppliers uniquely for aeronautics, recognizing that their aeronautics business is not limited to Boeing and Airbus LCA, but includes business jets, general aviation, rotorcraft, and all variety of military aircraft. Other technologies grow out of work done for other industries, including such items as electric motors for hybrid cars, composite hulls for racing yachts, chopped fiber composites for consumer goods, automation technologies developed for sails for boats, and precision tooling for the boating industry.[247]

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[243] The U.S. response to Question 343 describes how to conduct such an exercise.

[244] US RPQ 343, paras. 136-140; US RPQ 352, paras. 168-174.

[245] EC RPQ 335(g), para. 119.

[246] EC RPQ, 335(g), para. 119, *citing* Statement of Patrick Gavin, et al., para. 18 (emphasis in original) (Exhibit EC-1175(BCI)).

[247] Statement of Michael Bair, para. 41 (Exhibit US-7).

Many suppliers of such components participate in NASA research programs. There is no reason to believe that NASA foundational research is more useful to Boeing than it is to U.S. producers of aircraft components. As they *sell* their products to Boeing, Airbus, and anyone else who will buy at a market price, there is no reason to treat NASA's purchase of research services from them, or its provision to them of goods and services pursuant to Space Act Agreements, as a financial contribution or benefit to Boeing. Similarly, research relevant to component manufacturers would not become a financial contribution or confer a benefit to Boeing simply because it had "access" to the results of that research.

135. The evidence also shows that the EC greatly underestimated the value of aircraft components produced in the United States by valuing the revenues of producers of civil aircraft and parts based on data from the U.S. Census Bureau that covered only aircraft and *selected* parts.[248] More complete data from the U.S. Census Bureau show that the value of sales of aircraft components from 1989 to 2006 was $370 billion, six times more than the EC's incomplete data indicate.[249]

136. In addition to undercounting the value of parts, a problem of which the United States became aware only when looking behind the EC data to answer Question 343, the EC also double counted parts by allocating research expenses first over the value of sales by their producers, and then again over the value of parts that were incorporated in Boeing aircraft. The EC criticizes the United States for providing a numerical example, and not providing data on the value added by Boeing in its production of large civil aircraft.[250] The United States has noted that as a responding party, it bears only the burden of rebutting the EC's arguments, and not of attempting to correct the EC's errors.[251] Moreover, the United States did provide information on value added by aircraft manufacturers in its first written submission.[252] These data, presented in the table following this paragraph, show that components and other materials accounted for an

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[248] US RPQ 343, para. 139, notes 165 and 166.

[249] According to the EC's data, sales of civil aircraft and selected parts for 1989-2006 had a value of $507.3 billion, while sales of civil aircraft and parts by Boeing were worth $449.2 million, indicating sales of parts by suppliers worth $58.1 billion for 1989-2006. Exhibit EC-18, p. 1. The more complete U.S. Census Bureau data report sales of parts worth $370 million. Exhibit US-1353.

[250] EC RPQ 335(g), para. 120.

[251] The United States addresses this point above in the introduction to its comments on the EC response to Question 335(d)&(e).

[252] The U.S. first written submission stated:

> the EC has ignored the entire U.S. (non-engine) aerospace supplier community. Census data demonstrate that in 2002, for example, civilian aircraft manufacturers reported shipments valuing $38.7 billion. Their value added portion, however, was only $17.0 billion, whereas the total cost of materials was $20.3 billion. That cost of materials figure represents the large supplier-provided value in each aircraft sale.

US FWS, para. 207, *citing* Aircraft Manufacturing: 2002, Industry Series (issued December 2004), *available at* http://www.census.gov/prod/ec02/ec0231i336411.pdf (Exhibit US-77).

average of 55.9 percent of the value of U.S. aircraft manufactured from 1997 to 2002. Data submitted with the U.S. response to Question 343 shows that the value was essentially the same – 56.2 percent – when data for 1989-1996 are included.

	Total value of aircraft shipments	**Value added by aircraft manufacture**	**Materials as percentage of value**
1989	43,338,900	20,363,600	53.0%
1990	51,369,600	20,235,400	60.1%
1991	58,090,200	23,090,600	55.1%
1992	62,980,800	25,157,100	60.1%
1993	55,119,800	22,903,300	58.4%
1994	50,944,000	23,606,400	53.7%
1995	47,028,400	20,959,100	55.4%
1996	47,312,600	25,136,800	46.9%
1997	57,893,242	20,767,608	64.1%
1998	69,540,577	36,025,687	48.2%
1999	73,397,508	33,462,931	54.4%
2000	65,783,463	26,227,012	60.1%
2001	69,511,983	31,418,591	54.8%
2002	64,355,168	28,740,614	55.3%
Total, 1997-2002	400,481,941	176,642,443	55.9%
Total, 1989-2002	816,666,241	358,094,743	56.2%

Sources: For 1997-2002, Aircraft Manufacturing: 2002, Industry Series, p. 1 (Exhibit US-77) For 1989-1996, U.S. Bureau of the Census, Annual Survey of Manufactures, Statistics for Industry Groups and Industries, 1996, 1994, and 1992 editions, SIC code 3721 (Exhibit US-1346)

137. The EC attempts to show that correcting for the double counting of parts "would make little difference" based on the U.S. numerical example.[253] However, using the actual data, which was available to the EC, leads to a different conclusion. The EC notes that it used an allocation ratio of 82.3 percent based on U.S. Census Bureau data on sales of aircraft and selected parts, which understate the value of parts sales. Using only the comprehensive data on sales of all aircraft and aircraft parts from the Census Bureau leads to a ratio of 49 percent – a substantial difference resulting from this single mistake.[254] This does not take into account the adjustments

[253] EC RPQ 335(g), paras. 121-122.

[254] Table preceding this paragraph; Exhibit US-1353.

that are also necessary to account for military aircraft producers, engine producers, and airline users of aircraft.

> *In formulating responses to the foregoing, please provide an estimate of the amount of funding at issue with respect to each of the areas of research in question, and the source of, or methodology used to derive, such estimates.*

138. In proposing corrections to account for its errors, the EC relies on its assertions that it made no mistakes and, therefore, had no corrections to make. The U.S. comments on this question and its parts have shown that the EC is incorrect. Therefore, its attempts to correct its errors are themselves erroneous.

139. The EC notes that its "top down" methodology resulted in the subtraction of $3.4 billion from the NASA budget before allocating the remainder exclusively to U.S. producers of civil aircraft and parts. However, the EC does not deny that even after its subtractions, some of what remained was funding for research that conferred no benefit to the production and development of civil aircraft, either because it pertains to a topic unrelated to large civil aircraft, or it was provided to an entity unrelated to Boeing. The inclusion of funding for such research in the EC's alleged subsidy magnitude calculation by itself invalidates the EC's figure, and makes it worthless for the Panel's evaluation of the EC's subsidy allegations. The EC exacerbates the error by continuing incorrectly to treat research into rotorcraft, unmanned vehicles, air traffic management, safety, and hypersonic flight as a financial contribution and benefit to Boeing.

140. As the United States explained in its response to Question 343, these errors flow from a fundamental conceptual flaw. The way NASA conducts research does not allow the accurate derivation of the value of research exclusive to civil research by subtracting funds devoted exclusively to other topics. Thus, there is no accurate way to perform the calculation the EC seeks to perform. The only accurate methodology is to use the actual data as to what NASA paid Boeing, as outlined by the United States in its responses to Questions 188 and 352.[255] If the Panel concludes that a top-down approach is necessary, it should use the methodology outlined in the U.S. response to Question 343.

346. In its First Written Submission (para. 201), the United States argues that, under the SCM Agreement, the value of the financial contribution from the provision of goods and services is limited to the value of the goods or services provided, not the full cost to the government of building and maintaining the goods or services provided (in that case, NASA's wind tunnels and personnel).

> *b) <u>To the European Communities</u>: Please discuss whether, and if so, in what circumstances and to what extent, it is appropriate to include within the value of a financial contribution in the form of a government provision of goods and*

[255] US RPQ 188, para. 223 and US RPQ 352, paras. 168-174.

> *services, within the meaning of Article 1.1(a)(1)(iii) of the SCM Agreement, the full costs incurred by the government in building and/or maintaining the goods and services so provided.*

141. The EC concurs with the U.S. understanding that the correct benchmark for determining whether a provision of goods or services confers a benefit is the market value of the goods and services.[256] As the United States noted in its response to Question 346(a), the cost of the good or service may serve as a surrogate for the market price when no comparable good or service is available on the market.[257] That is the case with NASA's wind tunnels and, in fact, the agency requires wind tunnel users to contribute money or other valuable goods, services, or data equivalent to the fully allocated costs of their use.[258] That is why NASA's provision under Space Act Agreements of aeronautics test facilities (or other facilities, equipment, or employees) to civil aircraft producers, military aircraft producers, engine manufacturers, and other commercial entities outside of the aerospace industry does not confer a benefit within the meaning of Article 1.1(b).[259]

142. The EC states that it challenges only those costs "that are allocable to Boeing's use of the facilities and equipment."[260] This would be an appropriate measure for those costs that must be allocated, such as indirect or overhead costs. Where costs actually incurred by a user are measurable, the actual cost, and not an allocated cost, is the proper measure and the most commonly accepted practice to determine costs.[261]

143. The critical failure in the EC's assertions regarding NASA facilities is that its allocation bears no relation to the measurement it advocates – "Boeing's *use* of the facilities."[262] Rather, the EC allocates NASA's facility costs, along with all other NASA expenses, exclusively to the civil aircraft industry, and to Boeing based on its share of that industry as calculated (incorrectly)[263] by the EC.[264] However, Boeing's "use" of these facilities is best reflected in the

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[256] EC RPQ 346(b), para. 128.

[257] US RPQ 346(a), paras. 159-161.

[258] US FWS, para. 201; Exhibit US-74.

[259] US FWS, paras. 241-250; Exhibit US-74.

[260] EC RPQ 346(b), para. 130.

[261] For example, NASA Procedural Requirement 9090.1, which governs the compilation of estimated price reports for Space Act Agreements, requires the use of actual costs for civil service labor, project staff labor, civil servants who direct charge time to the agreement, travel costs, purchases of equipment or support services, and any other direct charges. It allows allocations only of indirect costs. NPR 9090.1, Appendix C, p. 41 (Exhibit US-1364).

[262] EC RPQ 346(b), para. 130 (emphasis added).

[263] US RPQ 343, paras. 138-139.

Space Act Agreements that it had to sign to gain authorization to use the facilities under the programs challenged by the EC.[265] These documents, and the Estimated Price Reports associated with them, provide actual evidence of the costs related to Boeing's use of NASA facilities.

144. The United States further notes that, if the Panel were to adopt an allocation methodology instead of considering actual usage, the allocation factor proposed by the EC has no support in the evidence. Many entities outside the civil aircraft industry, including other U.S. government agencies, use NASA test facilities. Therefore, allocation factors that are more likely to reflect accurately Boeing's usage of NASA facilities would be Boeing's share of NASA aeronautics research contracting (10.4 percent)[266] or its share of the sales revenues for the industries that participate in NASA research and use its results (12.8 percent).[267]

347. The European Communities argues (EC RPQ 137(b), para. 155) that when NASA purchases goods or services from an entity pursuant to one of the NASA R&D programmes at issue, and then provides those goods and services to Boeing, the issue of pass-through is not implicated, as NASA is the entity actually providing the goods and services directly to Boeing. The European Communities further argues that the value of the provision of goods and services by NASA, even if those goods and services were originally purchased from another entity, is included in the estimated value of the subsidies to Boeing. Does this further argument rest on an assumption that the value of goods and services so provided by NASA to Boeing is equivalent to the amount that NASA spent to purchase those goods and services? If so, can the European Communities please justify this assumption?

145. The EC admits that its valuation methodology rests on the assumption outlined by the Panel.[268] In response to the request to justify this assumption, the EC provides no evidence supporting the assumption, but merely asserts that it is the "best information available."[269] In *Brazil – Tyres*, the Appellate Body found that a panel's assessment of the facts under Article 11 of the DSU "implies, among other things, that a panel must consider all the evidence presented to

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[264] The costs of NASA facilities are covered partially by the institutional support budgets and partially by program budgets. The EC allocates these largely based on Boeing's share of the industry producing civil aircraft and parts. Exhibit EC-25, pp. 9, 10, 11, 12, 15, 16, 17, and 18.

[265] Boeing may also use NASA facilities independent of funding under the challenged programs, in which case a fully reimbursable Space Act Agreement would be a likely option. The EC has excluded fully reimbursable Space Act Agreements, as well as any reimbursed portions of partially reimbursable Space Act Agreements, from the scope of its challenge. EC RPQ 158, para. 237.

[266] US RPQ 352, paras. 168-174.

[267] US RPQ 343, paras. 136-140.

[268] EC RPQ 347, para. 132.

[269] EC RPQ 347, para. 132.

it, assess its credibility, determine its weight, and ensure that its factual findings have a proper basis in that evidence."[270] The EC's cursory defense of this assumption does not meet its burden of proof, and would not allow the Panel to make the finding described by the Appellate Body with regard to the value of goods and services allegedly provided by NASA. This is a critical issue in the Panel's evaluation of the magnitude of the alleged subsidies, as the EC's assumption about NASA's purchase of goods and services from other contractors to give them to Boeing is the basis for $9.6 billion of its value of alleged NASA subsidies.[271]

146. The EC notes that, as explained in its response to Question 346(b), the cost of goods or services may serve as a surrogate for their market value in some circumstances.[272] The United States agrees with this observation in principle. However, the EC has not explained why using cost as a surrogate is appropriate in this particular instance. Nor has it explained why, if the value of the research results (as opposed to research services) is equal to the cost of producing them, an average of 82 percent of that value is attributable to Boeing based on its (incorrectly calculated) share of the industry producing civil aircraft and parts.[273] There is, in fact, no basis for such an outcome. The *only* evidence before the Panel on usage of NASA research results demonstrates that they are of broad interest, both outside the civil aircraft industry and outside the United States.[274] Thus, the EC's assumption is directly contrary to the evidence.

348. How does the European Communities respond to the United States' argument (US Comments on EC RPQ 148, para. 152) that the "the EC is including in its valuation calculation expenses that it concedes are not subsidies"?

147. The Panel's question refers to an observation the United States made regarding the EC's problematic distinction between a challenge to NASA institutional support "in and of itself" as a subsidy, and a challenge to the full value of the agency's institutional support budget as the

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[270] *Brazil – Tyres (AB)*, para. 184.

[271] US Comment on EC RPQ 324, *infra*.

[272] EC RPQ 347, para. 132.

[273] *See generally*, Exhibit EC-25, pp. 8-19. As incorrectly calculated by the EC, Boeing represented between 67 and 91 percent of that industry, and accordingly received the huge share of any alleged subsidies allocated to the industry producing civil aircraft and parts. Exhibit EC-18, p. 1.

[274] Representatives of the health services, computer, engineering, construction, semiconductor, military, and food services industries have served on the NASA Advisory Council. *Membership of the NASA Advisory Council, 1997-2007* (Exhibit US-143). Attendance at NASA conferences is even broader, indicating that NASA research is of interest outside the civil aircraft industry. US FWS, para. 193 (b) and (g). Many companies, universities, and government institutions outside of the civil aircraft industry use NASA's computational fluid dynamics code, OVERFLOW. List of OVERLOW Users (Exhibit US-1270). Scholarly publications generated under NASA programs are frequently cited by other researchers, both in the United States and in Europe. *List of publications based on work performed in the Integrated Wing Design (IWD) Project* (Exhibit US-1140(revised)). The reports issued by Boeing under its contracts with NASA are also frequently cited in scientific publications in the United States and Europe. *Reports and articles published by Boeing/McDonnell personnel pursuant to aeronautics research contracts*, (Exhibit US-1253).

magnitude of any subsidy. The United States observed that this was a concession that the EC is including in its valuation calculation expenses that it concedes are not subsidies.

148. The EC response merely repeats the assertion, arguing that it uses the value of the institutional support budget only "as a tool for valuation." It then notes that it allocated to Boeing approximately half of the aeronautics institutional budget, and cites that as evidence that it "excluded much institutional support from its subsidy estimates."[275]

149. The EC makes a distinction without a difference. If the EC says that it is not challenging something as a subsidy, but then treats the full value of the thing as the magnitude of the subsidy, it clearly includes in that valuation something that is not a subsidy. That is exactly what the EC does with NASA's institutional support budget. It treats the full value of NASA's institutional support budget as a financial contribution (and benefit) to be divided among companies in the U.S. industry producing civil aircraft, parts, and civil aircraft engines, based primarily on their share of sales of civil aircraft and parts.[276] The EC's allocation to Boeing of only part of the alleged institutional support subsidy reflects only that Boeing represented a portion of U.S. production of civil aircraft, engines, and parts. It does not reflect any allowance by the EC for the fact that it is not challenging the institutional support budget in and of itself.

150. The EC ends by attempting to make its estimate appear conservative, noting that it did not add a multiplier effect for knowledge, experience, and confidence.[277] The United States explains in its comments on the EC responses to Questions 371 and 373 that the development of knowledge, experience, and confidence is the *result* of any commercial transaction, including commercial research transactions. Therefore, they are not a financial contribution, and confer nothing that is more favorable than is available in the market. Therefore, as even the EC concedes,[278] they may play no role in the evaluation of adverse effects.

349. How does the European Communities respond to US Comments on RPQ 148(d), paras. 164-166?

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[275] EC RPQ 348, para. 135.

[276] The structure of Exhibit EC-25 masks this relationship. Pages 9 through 19 attribute to Boeing a share of each NASA program budget calculated first by excluding amounts that the EC believed were exclusively related to engines and hypersonic flight, and then allocating the remainder based in large part on share of the industry producing civil aircraft and parts. (The United States notes that, in fact, the EC used a measure that did not fully reflect the value of aircraft parts. US RPQ 343, para. 139, notes 165 and 166.) On page 5 of Exhibit EC-25, the EC allocates to Boeing a share of the institutional support budget equal to the share of total spending under the challenged aeronautics research programs alleged by the EC in each year. Under this logic, any remaining institutional support budget unallocated to Boeing would be a financial contribution (and benefit) to the other U.S. producers of civil aircraft engines, civil aircraft, or parts. Thus, the EC calculations treat every dollar of the institutional support budget as a subsidy to someone.

[277] EC RPQ 348, para. 136.

[278] EC RPQ 373(c), para. 295 ("Clearly, any element of a financial contribution that was available at market to a recipient and does not confer a benefit cannot be considered a source of adverse effects.").

151. In the comment cited by the Panel, the United States identified evidence showing that NASA's institutional support budget covered expenses of NASA being NASA – management and oversight, administrative facilities, offices and office equipment – that were not goods and services provided to Boeing. The EC concedes that such expenses are not themselves goods and services provided to Boeing. Nevertheless, it defends their inclusion in the valuation of the benefit to Boeing on the ground that they are "overhead" expenses that Boeing would have to pay if it were "to go into the market and buy the same goods and services . . . from a commercial research facility."[279] However, the EC has never provided any evidence that a commercial research facility would have the same expenses – both direct and indirect – as NASA. In contrast, the United States has shown that NASA incurs a number of expenses unique to NASA – costs of disseminating its research, costs of ensuring contractors' compliance with the complicated government procurement rules,[280] costs of maintaining wind tunnels used by other government agencies,[281] and costs of government employees' safety and air traffic research.[282] Thus, there is no basis to conclude that Boeing would pay these expenses were it to purchase goods and services in the market.

152. The EC also attempts to defend its treatment of institutional expenses by returning to an argument that it has repeatedly made – that the valuation methodologies it chooses are a "tool to estimate" rather than an allegation that particular expenses are financial contributions or benefits.[283] However, this assertion does not refute anything. The choice of a tool reveals the nature of the task the user contemplates, and the results of use can indicate whether the tool was appropriate.[284] Thus, the EC's attribution of NASA's entire aeronautics budget to the U.S. civil aircraft and parts industry and the engine industry indicates either an assumption that the entire budget is a financial contribution that benefits that production base, or a decision to treat as a subsidy to that group expenses that are not a subsidy to that group. The fact that the estimate is a "tool" does not change these implications of its use. The fact that the EC's valuation treats 57.5 percent of NASA's aeronautics employees as supplying services exclusively to Boeing – an outcome with no support in the evidence – indicates that the EC's choice of tools was bad. In other words, the fact that the estimate is a "tool" does not make it a good tool, or indicate that it produces results on which the Panel can rely.

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[279] EC RPQ 349, para. 138.

[280] US RPQ 148(d), para. 164.

[281] US RPQ 148, para. 154.

[282] US SNCOS, para. 41; US Comments on EC RPQ 136(b), para. 121; US RPQ 150(b), paras. 185-186; and US RPQ 163(g), para. 248. Part of the NASA contract spending funded through the program budgets consisted of agreements to fund research by other agencies, including the Federal Aviation Administration. *E.g.*, Aviation Safety Program 2003 Budget Estimates, p. SAT 4-19; Aviation Safety Program 2004 Budget Estimates, p. SAE 5013; Aviation Safety Program 2005 Budget Estimate, p. ESA 16-19 (Exhibit EC-382, pp. 26, 42, and 47/68).

[283] EC RPQ 349, para. 139.

[284] For example, no one would choose a sledgehammer to swat a fly on a window. If someone did choose that tool, the resulting pile of glass fragments would be good evidence that the choice was a bad one.

153. The EC returns to another recurring theme when it accuses the United States of being "less than forthcoming in providing actual information about the value of those goods and services."[285] To be clear, where NASA provides goods and services to Boeing, it seeks fair and reasonable compensation, and memorializes that provision in a Space Act Agreement.[286] The United States has provided the Panel all Space Act Agreements funded under the challenged programs, along with the information in its possession about the value of goods and services involved in those agreements.[287] NASA does not otherwise provide services or goods to Boeing. Therefore there is no more information to submit. In any event, the EC has never provided any authority under the DSU for a Panel to adopt a demonstrably bad methodology (or "tool") that produces demonstrably incorrect results.

350. In EC RPQ 163(f), para. 257, the European Communities argues that even when NASA spent funding under the R&D programmes at issue on entities outside of the US civil aircraft industry, it did so in furtherance of its objectives to improve the competitiveness of US civil aircraft producers, most notably Boeing, and it made the fruits of that spending available to the US civil aircraft industry. The European Communities then argues that such spending therefore constitutes a provision of goods and services to the US civil aircraft industry. Does the European Communities argue that NASA's spending under the R&D programmes represents the value of the "fruits of that spending" which were thereby made available to the US civil aircraft industry (suggesting that the "fruits of that spending" is the relevant measure for purposes of identifying the financial contribution, and that the spending is relevant to assessing to value or amount of the financial contribution), or does it argue that NASA's spending under the R&D programmes is itself the measure that constitutes the financial contribution in the form of a provision of goods and services within the meaning of Article 1.1(a)(1)(iiii) of the SCM Agreement?

154. The EC responds that it treats the value of NASA's payments to other contractors as the value of goods and services provided to Boeing. The U.S. comments on the EC responses to Questions 324 and 325 demonstrate that there is no evidence that NASA purchased goods and services from other contractors and provided them to Boeing. The only goods and services provided to Boeing were subject to Space Act Agreements, which indicate only that NASA provided goods and its employees supplied services for a common endeavor, and not that other contractors supplied goods or services to Boeing. Any goods or services supplied under Space

[285] EC RPQ 349, para. 138.

[286] US FWS, paras. 233-234; US RPQ 18, para. 39; US RPQ 160, paras. 150-154; and Exhibit US-74.

[287] Exhibit US-74; *Value of NASA Facilities, Equipment, and Employees Under Selected Space Act Agreements* (Exhibit US-1256(revised)); *Data on the estimated price reports taken from NASA's TechTrackS system* (Exhibit US-1347(BCI); Exhibits US-499, US-500, US-501, US-502, US-503, US-504, US-505, US-506, US-507, US-508, US-509, US-511, US-512, US-513, US-514, US-515, US-516, US-517, US-518, US-519, US-520, US-521, US-522, US-523, US-524, US-525, US-526, US-527, and US-528.

Act Agreements were not of significant value in comparison to the value of research contracts, and facilities usage was limited.

155. Otherwise, the "fruits of spending" with other contractors consist of reports and other results to which other enterprises, including Airbus, have access. Thus, there is no basis to treat the cost to NASA of purchasing such "fruits" as the value of anything provided to Boeing.

354. In EC RPQ 156 (para. 233), the European Communities states that it has established that "in conjunction with various contractual instruments entered into pursuant to the 23 RDT&E PEs, DOD provides goods and services (in the form of facilities, equipment and employees) to Boeing for dual-use R&D, a portion of which relates to LCA". Please explain what the European Communities means by "in conjunction with" and how this provision of goods and services that occurs "in conjunction with" contractual instruments is discussed in Section VI.H.2.a of the EC First Written Submission and Sections III.G.1.b.i.2 and III.G.2.a of the EC Second Written Submission.

156. The EC's response fails to provide any clarity regarding what it means by goods and services "in conjunction with" DoD contracts, and fails yet again to provide any evidence to support its arguments that DoD "provided" goods and services to Boeing for less than adequate remuneration. The primary evidence cited by the EC consists of cross-references to five DoD contracts cited in previous submissions.[288] None of them reference the provision of services. Under four of them, the only goods referenced by the EC appear in a provision for Boeing to use identified DoD facilities to carry out work under the contract.[289] The United States has explained that when DoD makes facilities available for performance of work under research contracts, it does so to reduce the overall acquisition cost of the research for DoD.[290] Thus, there is no "provision" of goods to Boeing within the meaning of Article 1.1(a)(1)(iii) of the SCM Agreement, but rather a temporary access designed to achieve DoD's objectives. The EC notes that one transaction provided software to Boeing for use during the term of the agreement.[291] However, it fails to note that the transaction was a cooperative agreement, in which Boeing agreed to upgrade that software to "allow that this program is commercially supported for future transparency effort and that the code is ready for use on the JSF {Joint Strike Fighter} program."[292] Boeing's compensation for that service consisted of funding from DoD and the right to commercialize the software for sale to other contractors. Thus, to the extent the original

[288] EC RPQ 354, para. 143.

[289] Other Transaction F33615-98-3-5104, art. 32 (Exhibit EC-519); Contract F33615-94-C-3400, art. 15 (Exhibit US-622(HSBI)); Agreement F33615-98-2-5113, art. 32 (Exhibit US-636(HSBI)); and Contract 33615-96-C-1958, art. 16 (Exhibit US-618(HSBI)), *cited in* EC SWS, para. 500.

[290] US SNCOS, paras. 27-32.

[291] Agreement F33615-97-2-3400, art. 26 (Exhibit US-612(HSBI)).

[292] Agreement F33615-97-2-3400, Attachment 1, para. 1.7 (Exhibit US-612(HSBI)). "JSF" stands for "joint strike fighter," an aircraft produced by Lockheed Martin.

version of the software was "provided" to Boeing, it was part of the exchange of value by which DoD obtained improved software for its own further use. The EC has presented no evidence to suggest that the compensation paid to Boeing for upgrading that software provided more than adequate remuneration.

157. The EC attempts to bolster its argument by observing that RDT&E budgets "make available the resources necessary to 'conduct' RDT&E activities."[293] The support cited for this assertion is a generic statement in certain RDT&E program element descriptions that "all efforts in this program element contain the resources necessary, including civilian salaries, to manage, conduct, and document the technical activities."[294] The statement indicates only that DoD employees perform and administer research. The United States has explained that they do this to promote *DoD's* "warfighting" capabilities.[295] Regardless of the objective of their activities, the simple fact that they "conduct" research does not signify that they conduct research *for contractors* in general or *for Boeing* in particular.

158. The EC moves on assert that DoD employees, including those at the Air Force Research Laboratories ("AFRL"), were "working in collaboration with Boeing employees to develop dual-use technologies."[296] This is a complete fiction. The only authority the EC cites is its own statement in its second written submission (with no citation) that "{t}he AFRL's emphasis on 'warfighting' does not mean AFRL personnel do not help to research and develop technologies with potential applicability toward LCA."[297] This unsupported assertion is not *evidence* of anything, and certainly does not show that AFRL employees research topics relevant to civil aircraft, or conduct activities "in collaboration with" Boeing.

159. Thus, the EC's response to this question references no evidence that DoD provided goods and services to Boeing for less than adequate remuneration under its contracts. To the extent that the EC's assertions regarding the provision of goods and services "in connection with" contracts constitute an allegation that such provisions occur without written contractual authority, the EC provides no evidence whatsoever of DoD engaging in such activities, which would be illegal. Therefore, there is no basis in fact for the EC's claim regarding provision of goods and services.

355. In US Comments on EC RPQ 156, the United States asserts that "{t}o this point, the EC has provided no clarity as to what it is challenging in addition to DoD payments to Boeing for RDT&E services" and that "the EC fails in its attempt to string together

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[293] EC RPQ 353, para. 144, *citing* EC SWS, para. 498 and EC FWS, para. 895.

[294] Materials Budgets, TY 1996, p. 2 (Exhibit EC-720, p. 39/275), *quoted in* EC SWS, para. 498 and EC FWS, para. 895.

[295] US FWS, para. 80.

[296] EC RPQ 354, para. 144, *citing* EC SWS para 499.

[297] EC SWS, para. 499.

portions of past submissions to create an individualized assessment of alleged DoD provisions of goods and services through contracts and not explicitly stated in contracts, and does not make a prima facie case of an actionable subsidy with regard to such transactions". How does the European Communities respond to the points made by the United States (US Comments on EC RPQ 156, para. 215)?

160. As the United States explained in its comments on the EC response to Questions 354, the evidence does not support the EC allegation that DoD provided goods and services to Boeing for less than adequate remuneration. In addition, the EC fails to provide any clarity as to whether it is alleging that DoD provides goods and services to Boeing outside of the context of a contract, which would be illegal under U.S. law.[298]

161. The EC also asserts again that the United States has failed to cooperate, and faults the United States for not providing a full explanation of how DoD spends its funds for dual-use RDT&E activities.[299] This is incorrect. The United States has attempted to understand the EC's thoroughly confused, contradictory, and shifting allegations regarding DoD. It has provided a large volume of documents, which provide evidence that the bulk of DoD research has no applicability to large civil aircraft.[300] Any area of overlap is small, and limited further by U.S. export control laws, which prohibit the export of weapons-related technologies.[301] Where potential dual-use applications exist, DoD attempts to use the civil application as a means to reduce the cost of attaining its military objectives.[302] All of the transactions identified by the United States were subject to competitive bidding, which ensures that DoD's acquisition costs reflect market terms.[303] It is true that the weight of this evidence disproves the EC's theories. That, however, is because the EC is wrong, and not because the United States has withheld anything.

356. In EC RPQ 201(a) (para 357), the European Communities argues that "{a}s with NASA, certain DOD in-house and out-of-house expenditures pay for the provision of goods and services to Boeing, and therefore are properly accounted for in the total level of support provided to Boeing through the general aircraft RDT&E PEs". In EC RPQ 201(b) (para. 359), the European Communities argues that its "estimates properly took into account DOD's various funding flows, and also captured the value of dual-use non-engine aircraft-related goods and services provided to Boeing by virtue of DOD's in-

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[298] US Comment on EC RQ 112(a), para. 20; US Comment on EC RPQ 148(d), para. 168.

[299] EC RPQ 355, para. 147.

[300] The U.S. first written submission discusses many of these documents. US FWS, paras. 124-152. *See also*, US RQ 208(b), para. 290.

[301] US FWS, paras. 166-175; US RQ 208(b), para. 289; US Comment on EC RQ 190(b), para. 325.

[302] US FWS, paras. 124-126; US SNCOS, paras. 27-32.

[303] US FNCOS, paras. 47 and 51; US SNCOS, paras. 12 and 17-19; Closing Statement of the United States at the Second Substantive Meeting of the Panel with the Parties, para. 13; and US RPQ 190, paras. 226-227.

house and out-of house funding:. Could the European Communities explain in detail what it means by DoD's "in-house and out-of-house" expenditures and funding, and when and how such expenditures/funding result in a provision of goods and services?

162. The EC responds to this question by explaining that by "out-of-house expenditures" it means that DoD buys goods and services from other contractors and gives them to Boeing.[304] It explains that "in-house" expenses refer to research performed by DoD employees and provided to Boeing through "on-going collaboration between DoD engineers or access by Boeing engineers to equipment and facilities maintained by DoD."[305] It contends that the difference between the two does not matter because both result in provisions to Boeing.[306] However, the hypothetical pathways by which it alleges that DoD provides goods and services are irrelevant because the EC cites no evidence that Boeing received goods or services from DoD under the challenged program for less than adequate remuneration.

163. The U.S. comment above on the EC response to Question 354 explained that the EC cited no evidence showing that Boeing received services from DoD, or that DoD employees collaborated with Boeing employees. The response to this question cites no further evidence, leaving the EC's assertions as to provision of services with no basis in fact.

164. The U.S. comment above on the EC response to Question 354 explained that the only evidence of Boeing receiving goods from DoD relates to a single software package, which Boeing returned to DoD after having performed upgrades. Thus, DoD received back something more valuable than what it provided. The EC has advanced no basis to conclude that this transaction afforded Boeing more than adequate remuneration for its efforts.

165. The U.S. comment above on the EC response to Question 354 explains that research contracts give Boeing access to DoD facilities solely to lessen the cost to DoD of acquiring the research in question. Thus, the four examples of contracts under which DoD gave Boeing access to DoD facilities during the term of the contract do not represent a provision of goods or services to Boeing. In addition, the EC has provided no reason to believe that access to DoD facilities, in the context of the particular contracts, resulted in the government paying more than adequate remuneration. The software and the access to facilities represent the only evidence that DoD's purchases of research services from Boeing even involved goods, let alone that those contracts "provided" goods to the company. Moreover, the EC has done nothing to address the adequacy of remuneration. Therefore, it has failed completely to support its claim regarding DoD's alleged provision of goods and services to Boeing.

166. In its response to this question, the EC makes one assertion absent from the response to question 355 – that DoD purchased goods and services from outside entities and gave them to

[304] EC RPQ 356, para. 149.

[305] EC RPQ 356, para. 148.

[306] EC RPQ 356, para. 151.

Boeing. It does not cite any evidence for this assertion. Therefore, it has failed to meet its burden of proof as to both "in-house expenditures" and "out-of-house expenditures."

357. How does the European Communities respond to the argument of the United States (US Comments on EC RPQ 201(a), para. 360) that "the EC has not met its burden of proof with regard to the assertion that any payments to universities, payments to other contractors, salaries of government employees, or costs of government equipment in the RDT&E budgets represented provisions of goods and services to Boeing or conferred a benefit to Boeing"?

167. The EC's response to this question cross-references its responses to Questions 354, 355, and 356, which the United States has addressed in its comments on those questions. From the outset of this dispute, the EC arguments have been completely devoid of evidence that DoD researchers worked for or with Boeing employees on research projects. Thus, it has failed to meet its burden of proof with regard to services. With regard to goods, the EC has cited only five DoD contracts that even *mention* DoD property. In four of them, the "goods" are DoD "facilities" to which Boeing employees get temporary access to perform their work for the government. This is not a "provision" of goods to Boeing, as the "goods" never left the control of DoD and were being used for DoD's purposes, not those of the contractor. The fifth contract was a cooperative agreement in which Boeing received government-owned software for the purpose of upgrading it. As compensation, Boeing received money and the right to commercialize the new version of the software. The EC has provided no evidence that this exchange provided more than adequate remuneration to Boeing.

168. The notable absence of evidence that Boeing received goods and services from the DoD for less than adequate remuneration by itself disproves the EC's assertion that DoD bought goods and services from other contractors to confer them to Boeing. However, it is also noteworthy that the contracts cited by the EC make no mention of other contractors' goods or services being provided to Boeing.

169. The EC also suggests that the Panel take adverse inferences to support the EC's assertions that DoD provided goods and services to Boeing for less than adequate remuneration.[307] Neither this response nor anything in the EC's prior submissions would justify taking such a step.

358. The European Communities indicates that for projects listed in budgets dated February 1997 or earlier, when the DoD RDT&E budgets did not identify specific tasks, CRA conservatively included only a portion of the funding precisely to reflect the uncertainty regarding the total value of dual-use non-engine aircraft-related activities under those projects (EC RPQ 203 para. 371, and EC Comments on US RPQ 212. para. 261). At the same time, the European Communities indicates that CRA counted certain projects in

[307] EC RPQ 357, para. 153

their entirety where less than 100% of the project may have been dual-use and also excluded certain projects in their entirety where some portion of the project may have been dual-use. Thus, on balance, CRA's methodology and estimates remain sound (EC Comments on US RPQ 207. para. 225).

(a) Is the Panel correct in understanding that for projects listed in budgets later than February 1997 the European Communities counted certain projects in their entirety where less than 100% of the project may have been dual-use and excluded certain projects in their entirety where some portion of the project may have been dual-use?

(b) If the Panel understanding is correct, can the European Communities explain why for projects listed in budgets later than February 1997 the European Communities did not include only a portion *of the funding as it did for projects listed in budgets dated February 1997 or earlier?*

170. The United States has no comment on the EC response. However, it notes that the CRA estimate is plagued with other errors, which the United States has detailed in prior submissions.[308] These errors mean that the CRA analysis, on which the EC relies for its allegations that DoD funded the supposed civil portion of dual-use research conducted by Boeing, entirely lacks credibility and is entitled to no weight in the Panel's assessment. Therefore, the EC has failed to make a *prima facie* case that there is a financial contribution or a benefit to Boeing.

359. The European Communities states in para 262 of EC Comments on US RPQ 213 that the fact that certain dual-use (i.e., LCA-related) DoD RDT&E contracts identified by the European Communities did not fall under the 23 specific project elements referenced throughout these proceedings is irrelevant, as the European Communities has challenged all LCA-related R&D funding and support provided by DoD through its RDT&E Program, and not just 23 specific project elements. Please explain how this argument can be reconciled with the references made to the "23 ***challenged*** *DOD RDT&E PEs" in EC RPQ 171 and with the fact that in its Second Written Submission the European Communities observes that the figure of $2.4 billion "represents an estimate of the value to Boeing's LCA division of the dual-use RDT&E funding and support provided by DOD* ***through the 23 PEs at issue****" (EC Second Written Submission, para. 466 (emphasis added))?*

171. In its response to this question, the EC attempts to reconcile its repeated statements limiting its challenge to the 23 named PE numbers with its new position that it has always challenged *all* DoD RDT&E funding of allegedly dual-use research by Boeing. The United

[308] US FWS, paras. 129-148; US SNCOS, paras. 22-26; US Comment on EC RPQ 2, para. 4; US RPQ 207, paras. 252-263; US Comment on EC RPQ 201(c), para. 363; US Comment on EC RPQ 202, paras. 365-369.

States explained in its response to Question 361 that the EC's consultation request, panel request, and first written submission covered only the 23 listed PE numbers.[309] Moreover, the EC failed to identify in its panel request any "specific measures" as required under Article 6.2 of the DSU beyond the 23 PE numbers. [310] Accordingly, no other PE numbers would be within the terms of reference of the Panel

172. The EC tries to justify the expansion of its claim by asserting that the financial contribution, benefit, and specificity analyses in its first written submission related to "the entire RDT&E program."[311] However, both the financial contribution and benefit analyses referred to the CRA calculations based on the 23 PE numbers as representing the totality of the financial contribution and benefit.[312] The EC's factual presentation also addressed only the 23 PE numbers. Therefore, even if the brief legal allegations did not contain language limiting their scope to the 23 PE numbers, the evidence circumscribed the reach of its arguments.

173. The EC argues that its factual argument went beyond the 23 PE numbers because the first written submission discussed the Technology Reinvestment Project ("TRP") and Dual Use Applications Program ("DUAP").[313] However that discussion appeared in a section entitled "Additional Details Related to Selected RDT&E PEs[314] under the subheading "DUS&T and its Origins."[315] DUS&T ("Dual Use Science and Technology") was one of the 23 PE numbers.[316] Thus, the references to the TRP and DUAP programs take the form of historical background for one of the PE numbers, rather than separate allegations of financial contributions and benefits. CRA's analysis does not include research under either program in its estimates.

174. The EC argues that CRA's estimating methodology is only a "tool," and that it measures but does not define the EC claim.[317] As noted above, the EC's analysis did use language that

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[309] US RPQ 361, paras. 182-187.

[310] US RPQ 361, paras. 188-189.

[311] EC RPQ 359, para. 163.

[312] EC FWS paras. 763 and 765. A footnote to the financial contribution section states:

> CRA analyzed the budgets and descriptions for all of the RDT&E PEs identified above from FY 1991 through FY 2006 and used its expertise in aeronautical engineering and the global aerospace and defense market to determine the amount of RDT&E funding related to dual-use non-engine aircraft research that went to Boeing.

EC FWS, para. 763, note 1350. The benefit section describes this as "the total benefits to Boeing's LCA division from these RDT&E Program subsidies." EC FWS, para. 765.

[313] EC RPQ 359, para. 163.

[314] EC FWS, para. 724, heading 4.

[315] EC FWS, para. 725, heading a; EC FWS, paras. 725-732.

[316] EC FWS, paras. 692-694.

[317] EC RPQ 359, para. 164.

referred to the CRA analysis as limiting the scope of the arguments. In any event, as noted above, the choice of a tool does provide information about the thing being measured. In this case, by referencing only evidence related to the 23 PE numbers, the EC indicated that the financial contribution and benefit were limited to those numbers.

175. Finally, the EC argues that its identification of contracts outside the 23 PEs as relevant to its claim means that CRA's estimate of the value of research covered by the EC claims is low. This is not the case. The evidence showed that CRA exaggerated its estimate, and the value of the contracts cited by the EC is far too small to change that conclusion, even if the scope of the EC's claim could be expanded to include them.

363. Could Boeing ever claim the Washington B&O tax credit for property taxes and the Washington leasehold excise tax exemption and the Washington property tax exemption? How does the response to this question affect the European Communities' submission that manufacturers of superefficient airplanes have a current right or entitlement to all three measures (EC Second Written Submission, paras. 67, 82, footnote 127)?

176. The EC's response to Question 363 blurs the relevant facts and sets forth an erroneous conclusion. While it is correct that, theoretically, Boeing could elect to claim one or the other of the three measures from one year to the next, it can never take advantage of two or more of them in any given year. Moreover, as already explained, Boeing does not actually intend to claim either the leasehold excise tax exemption or the property tax exemption.[318] As such, the EC's quantification of the alleged subsidies provided to Boeing (which combines the alleged benefits of all three measures, going forward to 2024) is both legally impossible, and factually incorrect.

177. Sections 13, 14, and 15 of HB 2294 combine to provide a manufacturer with an exemption from, or a credit against property tax, or a tax assessed in lieu of property tax due (*i.e.*, the leasehold excise tax) or otherwise paid on land, buildings, machinery, and equipment used to manufacture a superefficient airplane. The leasehold excise tax is a tax on the use of public property by private or commercial businesses, and the leasehold excise tax is levied in lieu of a property tax.[319] Thus, an entity that is subject to a leasehold excise tax on certain property will not also be subject to property tax on that property. Both Sections 13 and 14 of HB 2294, which are the provisions for the leasehold excise tax exemption and property tax exemption respectively, explicitly provide that "{a} person taking the credit under section 15 of this act {B&O property tax credit for taxes paid} is not eligible for the exemption under this section."[320]

178. The EC correctly cites this language, but nevertheless concludes that "the language in Sections 13 and 14 does not mean that Boeing can never claim all three tax measures at issue."

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[318] US FWS, paras. 507-508, 511.

[319] US FWS, para. 506.

[320] HB 2294 §§13 and 14 (Exhibit EC-54).

[321] The EC's arguments to that effect are clearly contradicted by both the law and the actual facts.

179. First, the EC notes that an election with respect to one of these programs in one year does not bind Boeing to the same election in succeeding years. While this is true, it is not relevant because the fact that, theoretically, Boeing could elect to claim different exemptions or credits in successive years in no way supports the EC's position that Boeing benefits from all three of these measures every year, or its quantification reflecting such supposed accumulation of benefits.

180. Second, the EC also points out that while Sections 13 and 14 of HB 2294 explicitly preclude a manufacturer that is claiming one of the tax exemptions, to also claim the property tax credit, Section 15 does not contain the converse language – *i.e.*, that an entity claiming the property tax credit is not eligible for the tax exemptions in Section 13 and 14. Again, however, this is a *non sequitur*. The language in Sections 13 and 14 is sufficient to make it legally impossible to claim both a tax exemption and the property tax credit. Moreover, Section 15 provides a credit against taxes paid. If an entity is claiming a tax exemption under either Section 13 or 14, then that entity is not paying taxes and there is nothing against which to provide a credit. Language stating that an entity may not take a credit against tax it has not paid would be superfluous.

181. Third, the EC then puts forward an entirely speculative scenario in which it suggests that Boeing could somehow set up different legal persons so as to be able to take advantage of all three measures in the same year.[322] The EC's speculation simply does not have any factual basis. A whole range of unexpected events might occur over the next 15 years (*e.g.*, companies may change their business outlook, or Washington State might change its tax regime). Contemplation of such completely speculative scenarios falls far short of what is required to establish the provision of a subsidy within the meaning of the SCM Agreement.

182. All of this is particularly relevant for the EC's quantification, in which it has added up alleged[323] benefits from all three of the measures going forward to 2024.[324] In other words, the EC's quantification of the alleged subsidies assumes that Boeing will take and has taken the

[321] EC RPQ 363, para. 168.

[322] EC RPQ 363, para. 173.

[323] As set forth in the U.S. first written submission, the Washington State B&O tax credit for property taxes, the leasehold excise tax exemption, and the property tax exemption do not constitute specific subsidies under the SCM Agreement. US FWS, paras. 491-95, 506-08, and 509-11.

[324] *See* State and Local Subsidies to Boeing (Exhibit EC-27); ECFWS, para. 136, note 216. *See also* US FWS, paras. 493-94 for an explanation of the errors in the EC's quantification of the amount of the financial contribution with respect to B&O property tax credits.

B&O tax credit for property taxes, the leasehold excise tax exemption, and the property tax exemption in each year. As explained above, this would be illegal and is factually incorrect.[325]

364. In response to the European Communities' argument that by granting to Boeing certain guarantees and rights in connection with general infrastructure, the public authorities provide goods and services to Boeing within the meaning of Article 1.1(a)(1)(iii) of the SCM Agreement, the United States contends that the European Communities has not shown that any "legal certainty" (US Comments on EC RPQ 249, para. 443) was provided to Boeing that was not available under the general road improvement policy of the State of Washington with regard to all road improvements that were part of the Nickel Package, which was in process well before the State and Boeing entered into the MSA (US RPQ 246, para 414). The United States goes on to argue that the European Communities does not explain how the rights under Article 6.11 and Exhibit C-9 of the MSA would be either a "good" or a "service" or how "legal certainty" is relevant for the general infrastructure analysis. How does the European Communities respond to these statements?

183. In response to the Panel's question, the EC makes three basic points. First, it notes that it maintains its principal argument that the road improvements themselves would constitute the provision of goods and services *other* than general infrastructure.[326] Second, the EC argues that Boeing was somehow provided "legal certainty" or a "legal right" beyond the Nickel Package and the general road improvement policy of Washington State.[327] Third, it continues to argue that such "legal certainty" is a good or a service other than general infrastructure, irrespective of whether the panel considers the underlying road improvements to be general infrastructure.[328] Each of these arguments fails.

184. First, contrary to the EC's continued assertions, the Washington State road improvements at issue constitute general infrastructure within the meaning of Article 1.1(a)(1)(iii), and therefore are not a financial contribution to Boeing or a subsidy.[329] As the United States demonstrated in prior submissions, the I-5 and SR-527 improvements projects were completed as part of a state-wide package to improve infrastructure throughout the State. Concerns about traffic problems on I-5 and SR-527, as well as plans to alleviate them to the benefit of the general public, predated the expansion of the Boeing facility and the Project Olympus Master

[325] US FWS, paras. 507-508, 511.

[326] EC RPQ 364, para. 176.

[327] EC RPQ 364, para. 178.

[328] EC RPQ 364, para. 184.

[329] US FWS, para. 528; *See also* US SWS, para. 142.

Site Agreement by many years.[330] Indeed, I-5 and SR-527 are major highways used by the general population and countless businesses from within and outside of Washington State.[331]

185. Second, the EC's argument that it has already established that Boeing was provided some sort of "legal certainty" or a "legal right" beyond the Nickel Package and the general road improvement policy of Washington State is equally unavailing. The road improvements were designed and built in accordance with the preexisting Washington State Department of Transportation highway standards.[332] Boeing did not have a right to define the specifications of the publicly financed road improvements;[333] instead, Boeing would be *consulted* in the design of the roads.[334] A wide range of other entities were also consulted in the design of the road improvements.[335] These broad-based consultations represent the typical planning process that a state or municipality would conduct to ensure that the road improvements will serve the needs of the relevant community.[336] The United States has also explained that what the EC refers to as a "performance guarantee" in fact merely confirms improvements to general infrastructure that were already being undertaken. The EC's suggestion that the I-5 and SR-527 road improvements were somehow prioritized based on the MSA, is disproven by the fact that, based on the Nickel Package, the State had already appropriated funding and had begun work prior to the MSA.[337]

186. In this context, it is also noteworthy that the EC's example of certain "guarantees" relating to a bus line does not "illustrate" or clarify the analysis.[338] In fact, it only injects further confusion. If a legally binding guarantee were provided to a company that its employees can ride the bus for free even if other users have to pay, this may constitute a "financial contribution", for purposes of Article 1.1(a)(1) of the SCM Agreement. That is, however, a distinct situation from the one at issue here. The Washington State road improvements are not provided exclusively to Boeing but instead are provided to all users of the Washington State highway system, in contrast to the free bus provided only to a single user. In addition, no legal "guarantee" was ever provided to Boeing that improvements would be finished within a certain time period. To the extent that Washington State finished road improvements within a certain

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[330] US FWS, para. 533.

[331] US FWS, para. 531.

[332] US FWS, para. 542, n. 733.

[333] US RPQ 246, para. 412.

[334] US RPQ 246, para. 412.

[335] US RPQ 128, para. 71.

[336] US RPQ 128, para. 64.

[337] US RPQ 245, para. 415. *See also* US RPQ 245, para. 416 with respect to the EC's suggestions that the provisions of the MSA somehow "guaranteed" or "reinforced" any alleged "legal certainty" provided. *See also* US RPQ 43 paras. 114-21; US FWS, paras. 586-88.

[338] EC RPQ 364, para. 183.

time period, it did so on the basis of the Nickel Package (which pre-dated the MSA) and the state's infrastructure policy generally, on the basis of consultations with a wide range of users of the roads, and in a way that makes these roads generally available to all users.

187. Most importantly, however, the United States has already shown that none of the elements relied on by the EC with respect to a presumed "legal certainty" or "legal right" actually changes the general availability of the road improvements at issue. Thus, the EC has pointed to nothing that demonstrates that any of these elements actually transforms otherwise general road improvements into non-general infrastructure.

188. Third, having repeated all of its flawed arguments regarding the alleged "non-general" nature of the highway improvements and the alleged provision of "legal certainty," the EC has now added a new argument. The EC suggests that the "legal certainty" it alleges to have been provided is a good or a service other than general infrastructure, irrespective of whether the Panel considers the underlying road improvements to be general infrastructure.[339]

189. The EC's argument appears to be that the MSA results in a "guarantee" of "constant planning, maintenance, and scheduling of future works on the part of the public authorities . . . {as well as} any future construction operations necessary to enlarge or upgrade the existing infrastructure to maintain the performance promises to Boeing."[340] Thus, says the EC, the MSA "require{s} the State of Washington to provide Boeing with certain *services* (which {the EC alleges} are not general infrastructure) so that the rights at issue are at all time fulfilled for Boeing."[341] According to the EC, this means that the right to those services itself, pursuant to *U.S. – Lumber IV*, can be treated as a provision of such services for purposes of Article 1.1(a)(1)(iii) of the SCM Agreement. The EC, in other words, appears to be arguing that the alleged "legal certainty" *itself* constitutes an actionable subsidy.

190. In order to establish an actionable subsidy, a complaining party must demonstrate that the measure at issue constitutes a financial contribution, which confers a benefit, and that such subsidy is specific. The EC has not even tried to demonstrate that this supposed "legal certainty" conferred a benefit, nor that it was specific. Its arguments that the legal certainty itself somehow constitutes a subsidy within the meaning of the SCM Agreement fails for that reason alone.

191. The EC's arguments with respect to "financial contribution," however, should be rejected as well. As discussed above, the EC has not actually demonstrated the existence of any sort of "guarantee" or "legal certainty" provided by the MSA. The MSA merely confirmed policies and actions that were already in place. Moreover, even if improvement measures, or services related to such improvements and the roads more generally were "guaranteed" to Boeing, this would not

[339] EC RPQ 364, para. 184.

[340] EC RPQ 364, para. 184.

[341] EC RPQ 364, para. 183.

have resulted in any kind of limitation on the availability of the infrastructure and thus would not make such infrastructure measures "non-general" for purposes of Article 1.1(a)(1)(iii) SCM.

192. The EC's reliance on *US – Softwood Lumber IV* to support its argument that a "right" to certain services can be treated as a provision of such services for purposes of Article 1.1(a)(1)(iii) of the SCM Agreement is also unavailing. The findings to which the EC refers in no way reflect the facts relevant in this dispute.

193. The Panel and Appellate Body in *US – Softwood Lumber IV* found that through the provision of harvest rights, Canadian provinces effectively transferred the property of the standing timber to the tenure holders[342], thus resulting in a "provision of goods" within the meaning of Article 1.1(a)(1)(iii) of the SCM Agreement. While the provinces only provided "rights" to logging companies to harvest standing timber, this effectively resulted in ownership on the part of those loggers of the felled trees, logs and lumber. As the Appellate Body stated: "{r}ights over felled trees or logs crystallize as a natural and inevitable consequence of the harvesters' exercise of their harvesting rights."[343]

194. In contrast, the services provided in connection with the road improvements are the same services that benefit all users of the roads. These services to which the EC refers are merely the general maintenance and upkeep of the roads that the State would undertake regardless of the MSA, and that are provided for the general use of all users of the roads. The services do not place any limitations on the general availability of the roads and, therefore, do not transform the road improvements into anything other than general infrastructure.

195. Finally, the EC's example regarding an uninterrupted supply of electricity[344] is inapposite as well. The EC tries to compare the situation regarding the general infrastructure improvements to the I-5 and SR-527 highways to a situation where a government would guarantee to a private entity, and to that one private entity alone, the uninterrupted supply of electricity even if all other users receive no electricity, for example because of a general electricity failure.

196. Assuming *arguendo*, that the EC is right that in that particular situation, the provision of a guarantee to uninterrupted electricity supply through these emergency generators would constitute a financial contribution, this tells us nothing about the situation at issue in the current dispute. The only thing to which Boeing has access is the general road network in Washington State, including the I-5 and SR-527 highways, both of which are generally accessible and actually used by numerous other users. No alternative roads are constructed that are only available for emergency Boeing use, nor is there any suggestion that the existing roads would ever be accessible to Boeing but not to other users. The real comparison, in other words, is

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[342] *US – Softwood Lumber CVD Final (Panel)*, para. 7.15.

[343] *US – Softwood Lumber CVD Final (AB)*, para. 75.

[344] EC RPQ 364, para. 185.

between Boeing and a company that has access to a government electricity network, together with hundreds of thousands of other users, all of whom have access as well.

197. In sum, the EC's argument boils down to a claim that the MSA would have provided Boeing with a guarantee to something that was already happening (road improvements) and that is generally available to all users in Washington State. The United States has already discussed at some length how the provisions of the MSA did not have the kind of legal effect the EC claims they had. Moreover, even if they did, this would not have resulted in any limitations on the availability of the underlying infrastructure. As that underlying infrastructure is "general," any services related to it, as well as any "rights" relating to such services would be "general infrastructure" as well. Finally, as noted above, the EC has not even attempted to demonstrate that any "guarantee" or "legal certainty" would have conferred a benefit on Boeing and is specific. The EC has, in no way, satisfied the standard necessary to establish the existence of an actionable subsidy under the SCM Agreement.

III. ADVERSE EFFECTS

370. The Panel invites the parties to submit comments, if any, on the Appellate Body Report in US – Upland Cotton (Art. 21.5 – Brazil) circulated to WTO Members on 2 June 2008, and the Panel Report as modified by the Appellate Body Report. The Panel is interested in the comments of the parties to the extent that the parties deem the Appellate Body Report and the Panel Report as modified by the Appellate Body Report to be pertinent to the present dispute. Without limiting the scope of the foregoing, the Panel is interested in receiving the parties' comments on the extent to which the Appellate Body Report and the Panel Report as modified by the Appellate Body Report are pertinent to the following issues:

(a) the appropriateness of adopting a "unitary" analysis in respect of identifying each of the following: price suppression and its causes, lost sales and its causes, displacement or impedance of imports and its causes, and displacement or impedance of exports and its causes;

198. The United States has combined its comment on the EC's response to this part of the question with its comment on the EC response to part (b) of the question.

(b) the appropriate standard for assessing whether "but for" the subsidies, the serious prejudice in question (i.e., significant price suppression, significant lost sales, displacement or impedance of imports and displacement and impedance of exports) would not have occurred.

199. The EC's response to Question 370 goes on at considerable length in an attempt to show that its adverse effects case meets the requirements of the SCM Agreement as articulated by the Appellate Body in *US – Cotton Subsidies (21.5).* All that those pages do, however, is distill the EC's adverse effects case in a way that exposes its essential weaknesses.

200. Below, the United States comments on the EC's discussion of the Appellate Body's report in *US – Cotton Subsidies (21.5)* in terms of:

(i) the appropriate reference period and other temporal aspects of the Panel's serious prejudice inquiry; and

(ii) the legal standard for assessing causation, and the implications of using "unitary" and "but for" approaches in that assessment.

At each step, it is very clear that the EC has failed to demonstrate that the alleged subsidies have caused adverse effects.

The Reference Period and Other Temporal Aspects of the Panel's Serious Prejudice Inquiry

201. The EC has contradictory views concerning the appropriate reference period in this dispute. The EC argues that the reference period should be confined to 2004-2006 on the basis that only those years reflect "current market conditions."[345] Yet, the EC has also collected data on alleged subsidies and Boeing financial data from 1989 through 2006 and asks the Panel to take into account the supposed long-term effects of the alleged subsidies.[346] By endorsing the Appellate Body's approval of "a long term assessment" of the effects of subsidies, the EC necessarily endorses a review by the Panel of evidence that extends well before the period 2004-2006. The EC even quotes with approval the following passage from the Appellate Body's report in *US – Cotton Subsidies (21.5)*:

> {N}othing in Article 6.3(c) of the SCM Agreement suggests that the examination of the effect of a subsidy must focus exclusively on the short-term perspective . . . . In our view, the effect of a subsidy on production can also be assessed on the basis of a long-term perspective that focuses on how the subsidy affects decisions of producers to enter or exit a given industry.[347]

202. Thus, there is no textual basis in the SCM Agreement for the EC's position that the reference period cannot include years prior to 2004. Nor is there any defensible argument that the 2001-2003 period is somehow "historical," while the 2004-2006 period reflects "current market conditions."[348] The year 2004 was part of the 2001-2004 market downturn, while the years 2005 and 2006 were part of the 2005-2007 demand surge.[349] That demand surge has now ebbed, amid a global economic crisis. Indeed, it is difficult to see how the 2004-2006 period

[345] EC RPQ 370, para. 242.

[346] EC RPQ 370, paras. 244-246.

[347] *US – Cotton Subsidies (21.5)(AB)*, para. 392.

[348] *Cf.* EC RPQ 370, para. 242.

[349] US Comment on EC RPQ 72, para. 244-245.

could be properly considered "current" when it began more than four years ago and ended more than two years ago.

203. The correct approach is to take a longer-term perspective on the EC's serious prejudice allegations and market developments. This is particularly appropriate under the specific circumstances of this dispute, which feature allegations of subsidization from 1989 onwards and an industry with cycles of product development and sales that often last decades.[350] If the EC is correct that Boeing's large civil aircraft operations have been "massively subsidized" since 1989 to the detriment of Airbus, one would expect these allegations to be corroborated by clear long-term market trends.

204. In fact, the long term trends *contradict* the EC's allegations. The most striking developments among large civil aircraft producers over the past 25 years have been the rise of Airbus from a peripheral player in the market to its largest supplier (displacing Boeing) and the exit of two American producers from the market:

- Between 1995 and 2006, Airbus' share of global large civil aircraft deliveries rose from 32 percent to more than 50 percent.[351]
- From 2000 to 2006, Airbus gained 20 percentage points of delivery market share, while Boeing lost a corresponding share.[352]
- In 2003, Airbus displaced Boeing as the world's largest large civil aircraft producer for the first time, a position Airbus has yet to relinquish.
- In 2006, Airbus had what it described as its "best ever year in deliveries," its "2nd best year in orders," and the "highest ever industry backlog."[353]

There is, in short, no credible evidence that the alleged subsidies have had the effect of seriously prejudicing Airbus' participation in the large civil aircraft market over the long term.

205. Another advantage of a "long-term perspective that focuses on how a subsidy affects the decisions of a producer" over time is that it permits analysis of the temporal coincidence of the level of the subsidies at issue and the pricing and product development that allegedly caused serious prejudice. The EC is correct in noting that, while it may be a relevant factor, the Appellate Body did not require such a temporal coincidence.[354] The United States does not

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[350] US Comment on EC RPQ 73, para. 248; *see also* US Comment on EC RPQ 72, para. 246.

[351] US FWS, para. 703.

[352] US FNCOS, paras. 5, 96; Exhibit US-1113.

[353] US FNCOS, para. 97; Exhibit US-1114.

[354] EC RPQ 370, para. 250.

contend that its presence or absence is dispositive, but in this dispute, it is highly relevant that no temporal coincidence exists and that actual market developments contradict the EC's description of how the alleged subsidies operate.[355]

206. For instance, the evidence shows that the alleged subsidies were higher during the 2000-2002 period (for which the EC claims no adverse effects) than during 2004-2006, when they decreased to significantly lower levels, particularly as a percentage of Boeing's aircraft order values.[356] The EC attempted to fit its price effect causation theory with the facts by arguing that, in [***], Boeing "suddenly decided to use more of the cash available from the US subsidies to change its pricing strategy with respect to the 737NG."[357] This contention conflicts with the EC's earlier statement that the price effects of the alleged subsidies are "immediate and direct" in the year of receipt, such that Boeing does not conserve the alleged subsidies for potential future use.[358] More importantly, the price effects theory advanced by the EC and Professor Cabral runs headlong into the facts.[359] That theory predicts that if Boeing were to receive fewer subsidies, it would be forced to increase its aircraft prices.[360] Similarly, the Cabral model assumes that, if the level of alleged subsidies were to fall, then Boeing would have to curtail aggregate investment, which in the Cabral model is comprised of only "aggressive pricing," product R&D, and shareholder payments.[361] According to the EC's calculations, the levels of alleged non-recurring subsidies over the 2004-2006 period were, on average, significantly lower than the levels over the 2000-2003 period.[362] Yet, the 2004-2006 period does not feature a decrease in the types of Boeing investments specified in the Cabral model. In fact, and contrary to the predictions of the Cabral model, Boeing's [***], and product R&D and shareholder payments increased significantly.[363] Thus, no temporal coincidence exists to support the EC's price effects theory and the Cabral model on which it is based.

207. By contrast, there is a strong temporal coincidence between the alleged indicia of adverse effects and non-subsidy factors:

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[355] US FWS, paras. 929-930, 1059-1060; US SWS, HSBI Appendix, paras. 40-59; US Comment on EC RPQ 86, paras. 298-308.

[356] US RPQ 82, para. 222-223; US Comment on EC RPQ 86, paras. 306-307.

[357] Statement of the European Communities at the Confidential Session of the Panel's First Substantive Meeting with the Parties, para. 53.

[358] *Compare* EC FWS, para. 1322, *with* US SWS, HSBI Appendix, para. 40; US Comment on EC RPQ 86, paras. 298-308.

[359] US Comment on EC RPQ 86, paras. 300-305.

[360] US Comment on EC RPQ 86, paras. 306-307.

[361] US Comment on EC RPQ 86, paras. 306-307.

[362] US Comment on EC RPQ 86, paras. 306-307; ITR Magnitude Report, Appendix A, p. 4 (Exhibit EC-17).

[363] US Comment on EC RPQ 86, paras. 306-307.

- Boeing's [***].[364]
- Prices for Airbus' fuel-inefficient A340 [***].[365]
- The decline in A380 development costs freed up resources in 2006, which coincided with Airbus finally launching a primarily composite competitor for the 787, the A350 XWB.[366]

208. The absence of a discernible temporal coincidence between the alleged subsidies and the alleged adverse effects, and a strong temporal coincidence between the alleged indicia of adverse effects and non-subsidy factors are considerations militating against a finding that any serious prejudice is the effect of the alleged subsidies. Thus, the EC would have to identify evidence outweighing these considerations before it could make a successful *prima facie* case. No such evidence exists.

Assessing Causation: Implications of Using a "Unitary" Causation Analysis

209. As the Appellate Body found in *US – Cotton Subsidies (21.5) (AB)*, a panel has the discretion to adopt a unitary analysis of a serious prejudice claim.[367] The EC goes too far, however, when it argues "a unitary analysis is … required with respect to significant price suppression and impedance of imports or exports."[368] The SCM Agreement imposes no such requirement. Indeed, the original *Cotton* panel used a bifurcated approach to assess a claim of significant price suppression, and the Appellate Body upheld its findings.[369]

210. The EC apparently favors the mandatory application of a unitary analysis because it views such an approach as a short-cut to an affirmative finding of serious prejudice:

> A 'unitary' analysis identifies the effects caused by the subsidies and assesses whether they amount to a particular form of serious prejudice as part of a single assessment. For example, under a unitary analysis, a particular level of price effect from a subsidy is determined and found to be significant, within the meaning of Article 6.3(c) of the SCM Agreement.[370]

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[364] US Comment on EC RPQ 305, para. 616; US SWS, HSBI Appendix, paras. 6, 40-59, 62.

[365] US SWS, HSBI Appendix, para. 64.

[366] US SWS, HSBI Appendix, paras. 10-13. Thus, the absence of any drain on Boeing's development funds comparable to the A380 explains the two-year head start that the 787 enjoyed. It is not necessary to presume, as the EC does, that decade-old NASA research was the reason.

[367] *US – Cotton Subsidies (21.5)(AB)*, paras. 354, 368-370.

[368] EC RPQ 370, para. 191.

[369] *US – Cotton Subsidies (Panel)*, para. 7.1346; *US – Cotton Subsidies (AB)*, para. 433.

[370] EC RPQ 370, para. 192.

In this conception, a unitary analysis skips past the issue of whether a genuine and substantial relationship exists between the alleged subsidies and price effects and focuses instead on assessing the *degree* of those effects. While this is consistent with the EC's prior pattern of assuming the existence of subsidy-caused price effects in its argumentation, it falls far short of the SCM Agreement's requirements.

211. The key point is that the unitary or multistep analyses are simply methodologies to address whether the effect of the subsidy is one of the indicia of serious prejudice.[371] Under either approach, the Panel must (1) determine whether a "genuine and substantial relationship of cause and effect" exists between the alleged subsidies and any serious prejudice,[372] and (2) "ensure{} that the effects of other factors . . . did not dilute the 'genuine and substantial' link between the subsidies" and the alleged serious prejudice.[373] That is, the Panel must evaluate non-subsidy factors – a process that, according to the EC, "is a fundamental part of the 'unitary' approach to causation."[374] As discussed below, no genuine and substantial causal relationship exists between the alleged subsidies and the claimed serious prejudice in this dispute. The market developments that the EC cites as indicia of serious prejudice are explained by the non-subsidy factors cited by the United States, not by the alleged subsidies. [375]

Assessing Causation: Implications of Using a "But For" Approach to Causation

212. As with its treatment of a unitary analysis, the EC takes liberties with the Appellate Body's discussion of a "but for" approach to causation. The Appellate Body in *US – Cotton Subsidies (21.5)* found that the "but for" test requires "a genuine and substantial relationship of cause and effect" between a subsidy and serious prejudice.[376] The EC rephrases the Appellate Body's formulation as permitting a finding of serious prejudice through the effects of a subsidy "if the evidence supports a finding that one or more of the particular forms of serious prejudice set out in Article 6.3 are the effect of, in the sense of being substantially linked to, the subsidy."[377] By substituting "substantially linked to" for the Appellate Body's "genuine and substantial relationship of cause and effect," the EC appears to loosen the " but for" test to the point where it is no longer necessary to show a cause-and-effect relationship between a subsidy and the behavior of the recipient that causes serious prejudice. There is nothing in the *US – Cotton Subsidies (21.5)(AB)* report to support the EC's position on this issue. Instead, the

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[371] *Cf.* EC RPQ 370, para. 206 ("But whether a unitary or multi-step causation framework is used makes no difference . . . .").

[372] *US – Cotton Subsidies (21.5) (AB)*, para. 374, *quoting US – Wheat Gluten (AB)*, para. 69.

[373] *US – Cotton Subsidies (21.5) (AB)*, para. 375.

[374] EC RPQ 287, para. 581.

[375] US Comments on EC RQ 287, paras. 522-533.

[376] *US – Cotton Subsidies (21.5) (AB)*, para. 374, *quoting US – Wheat Gluten (AB)*, para. 69.

[377] EC RPQ 370, para. 210.

Appellate Body stressed that "the 'but for' test should determine that price suppression is the effect of the subsidy and that there is a 'genuine and substantial relationship of cause and effect'" between the two.[378]

213. The great weakness in the EC's case is that, despite its embrace of a "but for" causation standard, it has offered no hard evidence that ties the bulk of the alleged subsidies to Boeing's pricing or product development decisions. In paragraphs 213 through 236 of its response to Question 370, the EC purports to demonstrate the "genuine and substantial relationship of cause and effect" required by the SCM Agreement between the alleged subsidies to Boeing and (1) significant suppression of Airbus' prices, (2) significant sales lost by Airbus to Boeing, and (3) displacement and impedance of Airbus sales in various country markets. These paragraphs, which go to the heart of the EC's case, cite portions of prior EC submissions, but those old arguments still do not fill the holes in the EC's causation theories.

214. The EC relies on four nominally distinct causation arguments to make its case, but not one of them is conceptually sound, all but one of them depend on the EC's exaggerated aggregate amount–of-the-subsidy calculation, and none of them is supported by the evidence.

215. **CVD-style allocation of alleged subsidies.** The first EC causation argument is that the *convention* used by administrators of national countervailing duty ("CVD") laws to allocate the full amount of subsidies over imports on an *ad valorem* basis for purposes of assessing countervailing duties is an accurate "counterfactual" measure of the way in which subsidies affect the recipient's pricing. The EC has not offered any theoretical justification for this assertion, much less any evidence to prove that it is so. In other words, the EC's CVD-type analysis assumes, rather than proves, its cause and effect conclusion.[379]

216. **The Cabral Report and Model.** Though more elaborate in form, the EC's second causation argument, premised on the Cabral Report, suffers from the same basic defect of assuming its key conclusions. The economic model Professor Cabral uses is structurally flawed and the Cabral Report depends on a series of assumptions of fact that are either unsupported or contradicted by the evidence.[380] Moreover, because Professor Cabral concludes that there were strong economic incentives for Boeing to make the product development and pricing decisions that it did, his analysis boils down to the proposition that the subsidies gave Boeing an ability to develop and price its aircraft that it would not otherwise have had. His argument is, in other

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[378] *US – Cotton Subsidies (21.5) (AB)*, para. 374, *quoting US – Wheat Gluten (AB)*, para. 69.

[379] US RPQ 100, para. 251-252; US Comment on EC RPQ 97, paras. 359-363; US Comment on EC RPQ 303, paras. 607-610; US RPQ 392, paras. 313-315; US Comment on EC RPQ 372, *infra*.

[380] US FWS, 823-862; US SWS, paras. 178-184; US RPQ 90, para. 224; Comments of Prof. Greenwald, pp. 1-2 (Exhibit US-8); NERA Reply, pp. 5-6, 11 (Exhibit US-3); US RPQ 90, para. 224; US RPQ 95, paras. 242-245; US Comment on EC RPQ 89, paras. 344-347; US Comment on EC RPQ 95, paras. 353-355; US Comment on EC RPQ 98, paras. 364-367; US Comment on EC RPQ 307, paras. 623-628; US Comment on EC RPQ 308, paras. 629-631.

words, an "economic viability" argument that is presented differently from the EC's more explicit economic viability argument. It suffers from the same set of basic flaws, which the United States outlines below.

217. **Economic Viability.** The EC predicates its third effort to demonstrate a cause-and-effect relationship between subsidies and serious prejudice on the explicit assertion that "but for" the alleged subsidies, Boeing would not have had the financial resources to develop and price its large civil aircraft as it did during the period 2004-2006. To support this part of its case, the EC has presented an analysis of Boeing's financial statements that attempts to show that "but for" the alleged subsidies, Boeing's after-tax return on the capital invested in its large civil aircraft operations would have been less than Boeing's weighted average cost of capital.

218. Significantly, the EC does not argue that, but for the subsidies, Boeing's large civil aircraft operations would have lost money over the period 1989-2006. Instead, it claims that when the full amount of the alleged subsidies is deducted from the 1989-2006 profitability of Boeing's large civil aircraft operations, the returns, though positive, fall below the cost of capital invested in those operations. In fact, leading experts' independent analyses of BCA show that *even after deducting the full amount of the alleged subsidies from Boeing's revenues*, the returns on its large civil aircraft operations were well above the cost of capital invested in the business.[381]

219. In its response to Question 370, the EC argues that it is legally impermissible to examine BCA's ability to self-fund research projects allegedly funded by subsidies. In support of this position, it cites the Appellate Body's finding in *US – Cotton Subsidies (21.5)(AB),* that the compliance panel properly excluded "off-farm income" in reaching the conclusion that the revenues of U.S. cotton farmers were often significantly less than their costs.[382]

220. But in this dispute, even the EC concedes that Boeing's large civil aircraft operations have more then covered their costs over time even after deducting from Boeing's revenues the full (and exaggerated) amount of the alleged subsidies.[383] The debate is about the level of BCA's profitability, not whether it has been profitable.

221. Moreover, the funds at issue are in no way analogous to the "off-farm income" considered by the Appellate Body in *US – Cotton Subsidies (21.5)(AB).* The United States has *not* argued that Boeing's large civil aircraft operations have been viable because of cross-

[381] Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009), p. 1 ("Wessels Economic Viability Report") (Exhibit US-1358); Stern Stewart & Co., Comments on Economic Viability Analysis (July 29, 2009), p. 1 ("Stern Stewart Economic Viability Report") (Exhibit US-1359).

[382] EC RPQ 370, paras. 247-248.

[383] ITR Economic Viability Report at Table 1(a) (Exhibit EC-1393) (calculating BCA's "operating profit less subsidies" to be $6.695 billion for the 1989-2006 period, excluding 1995 and 1997).

subsidization.[384] To the contrary, the data show that, if anything, BCA's funds have benefitted other Boeing divisions, not *vice versa*. As the Stern Stewart Economic Viability Report states, citing the EC's own calculations,

> BCA has been a consistent generator of free cash flow and contributor to corporate coffers between 1989 and 2006, providing over $11 billion to The Boeing Company. In all likelihood, The Boeing Company has relied on BCA to subsidize and provide liquidity to other operating units.[385]

Over time, BCA's after-tax return on the capital invested in its operations has been more than enough to support its operations even if the full amount of the alleged subsidies are deducted from BCA's revenues. [386] There is, therefore, no legitimate *US – Cotton Subsidies (21.5)(AB)* question about Boeing's ability to develop and price its large civil aircraft as it did during the period 2004-2006.

222. However, the Panel should not even have to reach this question. The pricing and product development decisions that shaped Boeing's participation in the large civil aircraft market between 2004 and 2006 were profit-maximizing and led to a sharp "bottom line" improvement in Boeing's business by 2006. Therefore, the EC cannot (and does not) claim that those decisions did not make good economic sense.[387] Given the undisputed fact that Boeing's large civil aircraft operations were profitable, both with and without the alleged value of the subsidies, the only real question is how the EC can contest Boeing's ability to make profit-maximizing product development and pricing decisions between 2004 and 2006.

223. **Alleged Technology Effects.** The last of the EC's efforts to demonstrate a genuine and substantial relationship of cause and effect between the alleged subsidies and serious prejudice is a claim that the challenged R&D programs enabled Boeing to launch the 787 when it did. This argument is impossible for the EC to sustain because there is no evidence that (1) the "knowledge, experience, and confidence" allegedly developed under the challenged programs is what enabled Boeing to launch the 787 when it did (in fact, all evidence is to the contrary), or that (2) Boeing could not have developed alleged "knowledge, experience, and confidence" by performing the same R&D with its own resources.[388] The United States provides a more extensive discussion of the flaws in the EC's technology effects arguments in its comments on the EC's responses to Questions 371, 373, 375, and 377.

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[384] *Cf. U.S. – Cotton Subsidies (Art. 21.5)(AB)* at 431.

[385] Stern Stewart Economic Viability Report, para. 6 (Exhibit US-1359) (citations omitted).

[386] Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009), p. 1 ("Wessels Economic Viability Report") (Exhibit US-1358); Stern Stewart & Co., Comments on Economic Viability Analysis (July 29, 2009), p. 1 ("Stern Stewart Economic Viability Report") (Exhibit US-1359).

[387] To the contrary, the EC concedes the point. EC RPQ 378, paras. 411-413.

[388] US Comment on EC RPQ 371 and 373, *infra.*

224. **Non-subsidy Factors.** The absence of evidence to support the EC's causation theories contrasts starkly with the abundant evidence demonstrating that the alleged indicia of serious prejudice are, in fact, attributable to non-subsidy factors.[389] As discussed above, these non-subsidy factors have a temporal coincidence with the market developments cited by the EC, while no temporal coincidence exists between those developments and the alleged subsidies. Nevertheless, the EC's response to Question 370 repeatedly asserts that it has accounted for non-subsidy factors and "isolated" the alleged subsidy effects as "*the*" cause of serious prejudice.[390] This supposed "isolation" is, however, dependent on (1) the CVD-style allocation of alleged subsidies on a per-aircraft basis; and (2) the per-aircraft price effects calculated by Professor Cabral. Neither comes close to establishing a "genuine and substantial relationship of cause and effect," for the reasons discussed above. Moreover, the EC's methodologies do not "isolate" anything. Each analysis calculates a figure by which Boeing's prices would supposedly have increased absent the alleged subsidies. The EC then assumes that Airbus prices would increase by the amount of the price increase projected for Boeing. At no point does either analysis take account of the other factors affecting the market, and how they might affect the situation. In short, these methodologies simply ignore the other factors, in direct contradiction of the SCM Agreement.

371. Of what relevance, if any, is the type of financial contribution through which a subsidy is provided (e.g., grant, loan, tax reduction) to the assessment of the effects of that subsidy? Is it appropriate to assess the effect of a subsidy in the form of funding of R&D activities on the basis of what the recipient learned from conducting the research that was funded by the subsidies?

225. In its response to Question 371, the United States observed that the type of a financial contribution informs the methodology to be used to assess any benefit it may confer.[391] An assessment of the effects of a subsidy also requires consideration of a broader set of factors. In a commentary submitted by the United States, Professors Stiglitz and Greenwald explain that the effect of a subsidy depends on "its nature, its amount and the condition (and, therefore, likely response) of the recipient."[392] Even though the European Communities endorses the considerations the professors outline, it ignores them when it asserts that a grant, a loan on below-market terms, and a provision of goods and services (the United States assumes that the European Communities intended to add "for less than adequate remuneration") of equal magnitude will have an identical effect on the recipient.[393] A proper assessment of the effects of each of these theoretical measures would have to inquire into the relationship that the various

[389] US Comment on EC RPQ 88, paras. 339-343.US Comment on EC RPQ 287, paras. 527-533.

[390] EC RPQ 370, paras. 221, 231.

[391] US RPQ 371, para 269.

[392] Stiglitz/Greenwald Statement, p. 1 (Exhibit US-1309) and EC RPQ 371, para 260 ("Greenwald and Stiglitz' approach is broadly similar to the approach the European Communities outlined above…".).

[393] EC RPQ 371, para. 257.

subsidies may have to the development, production, or sale of a particular product, and to any difference in the capital constraints (or lack thereof) of the recipients. As Profs. Stiglitz and Greenwald noted, these are fundamental questions that must be addressed, as they will bear significantly on the impact that a particular "type" of financial contribution will have on a recipient company.

226. In the second part of Question 371, the Panel asked whether the effect of a subsidy in the form of R&D funding could be assessed on the basis of what the recipient learned from conducting the research. The EC does not answer the Panel's question. Instead, it references its response to Panel Question 373, in which it argues that "what the recipient learned" – what it calls "knowledge, confidence and experience" – can be treated as the benefit (or used to "multiply" the benefit) of both the research funding and the provision of goods and services that it has challenged.[394] This "technological benefit" argument that the EC makes in its response to Panel Question 373 is inconsistent with Article 1 of the SCM Agreement and contrary to the facts. The United States addresses this issue in detail in its comments on the EC response to Question 373.

227. The answer to this question is that the facts dictate the appropriateness of evaluating the effect of a subsidy in the form of funding of research activities on the basis of what the recipient learned. Such an exercise will generally not be appropriate. Money is typically fungible, so that the use of a particular payment may bear little relation to its overall effect. The EC implicitly recognizes this point when it argues that the effect of the alleged NASA subsidies was to provide Boeing with cash that it used to reduce the price of its 737 and 777 aircraft. However, its argument fails because Boeing had sufficient capital and access to capital to be optimally invested in all uses of cash, including pricing, in the absence of the alleged subsidies. But because money is generally fungible, it is not possible to identify a particular source as having provided the money, goods, or services that led to development of a particular piece of knowledge. Thus, it is impossible to conclude that the knowledge was the effect of that funding if the recipient had other funds that it could have used to conduct the research or obtain the relevant goods and services.

228. However, as Professors Stiglitz and Greenwald have explained, the effect of a subsidy depends on the nature of the measures at issue, the amount of the funding, and the condition of the recipient. This observation applies equally to research funding. If research funding is "tied to a supply creating launch decision," then it may lead to a significant impact on the market.[395] In this case, the EC has demonstrated no such tie – specifically, the research funding it has challenged was (1) related to foundational research (not research applicable to any commercial product), (2) at most $775 million over a 17-year period, and (3) provided to a company with

[394] EC RPQ 373, paras. 281-282.

[395] Stiglitz/Greenwald Statement, p. 3 (Exhibit US-1309).

sufficient capital (and access to capital) to self-fund all of the same research.[396] Thus, to the extent the Panel finds that these measures constitute subsidies, the appropriate way to assess their impact is "to look at the effect of a grant of an equivalent amount of unrestricted cash."[397] Indeed, this is precisely the analysis performed by the EC's economic expert, Professor Cabral, and the United States has rebutted the applicability of his model and the soundness of the assumptions on which his calculations are based.[398]

229. The EC nevertheless has argued that particular knowledge is the effect of the challenged NASA and DoD research programs. It submitted a document in which four Airbus engineers examined the published results of NASA programs, and purported first to associate specific technologies with specific NASA funding, and then to link those technologies with those used on the 787 and other Boeing aircraft. As noted above, the first step in this analysis would not meet a party's burden of proof to establish that the technologies were the effect of NASA funding unless the company could not have funded the research itself. The United States has shown that Boeing devoted large amounts of its own funds to researching commercially critical large civil aircraft technology, and had access to additional resources to fund needed research. There is accordingly no evidence to suggest that Boeing could not, or would not, have used its available capital to self-fund that research, whether performed in-house, out-of-house, or as part of a collaborative effort. Thus, research funding of the nature and amount at issue in this dispute, provided to a company in Boeing's position, does not have a supply-creating effect.

230. With regard to the second step in the Airbus engineers' presentation, the EC has demonstrated no connection between the learning that resulted from the challenged research funding and the launch of the 787. The distance between foundational research funded by NASA and commercially applicable technologies underscores the difficulty of linking any individual dollars spent at the early learning stage to the development or production of a particular commercial product. In this case, Boeing's engineers have confirmed that the government-funded research was too foundational (as well as being too outdated or too unrelated) to have impacted the company's decision to launch the 787. Thus, even if the Panel were to attempt to assess the effect of the challenged research programs on the basis of learning that resulted when Boeing undertook research for NASA or DoD, the evidence would not sustain a finding of *adverse effects* under Articles 5 and 6.3 of the SCM Agreement.

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[396] *E.g.*, US RPQ 78, para 268, US RQP 87, para 318; US Comment on EC RPQ 292, paras. 580-587; US Comment on EC RPQ 378, *infra*.

[397] Stiglitz/Greenwald Statement, p. 3 (Exhibit US-1309).

[398] US FWS, 823-862; US SWS, paras. 178-184; US RPQ 90, para. 224; Comments of Prof. Greenwald, pp. 1-2 (Exhibit US-8); NERA Reply, pp. 5-6, 11 (Exhibit US-3); US RPQ 90, para. 224; US RPQ 95, paras. 242-245; US Comment on EC RPQ 89, paras. 344-347; US Comment on EC RPQ 95, paras. 353-355; US Comment on EC RPQ 98, paras. 364-367; US Comment on EC RPQ 307, paras. 623-628; US Comment on EC RPQ 308, paras. 629-631.

372. The European Communities calculates the value of some of the alleged subsidies up until 2024. Further, the European Communities allocates the value of recurring subsidies that reduce Boeing's marginal unit costs to the year that an LCA is ordered, even though Boeing will receive the subsidies only at the time of delivery (EC RPQ 79). In allocating the recurring subsidies that reduce marginal cost in this manner the European Communities deems the year of order to be three years prior to the year of delivery. Given the European Communities' use of the reference period 2004-2006 to establish the existence of serious prejudice, the Panel understands that the forecasted deliveries for the years 2007, 2008 and 2009 are the relevant years from which the orders, and the value of the recurring subsidies that reduce marginal unit cost, are derived for the 2004-2006 reference period.

(a) Is the Panel correct in understanding that this is the only way in which predicted future subsidy values are used in the European Communities' serious prejudice claim?

(b) Could the European Communities update its calculations to reflect actual delivery data for the years 2007 and 2008 and, if possible, 2009, rather than relying on forecasts? At para. 35 of Exhibit EC-13 (International Trade Resources LLC, Calculating on a Per-Aircraft Basis the Magnitude of the Subsidies Provided to US Large Civil Aircraft, *20 February 2007), the European Communities refers to a July 2006 Airline Monitor report on which it relies to forecast future deliveries of aircraft. Could the European Communities please provide a copy of the Airline Monitor Report to the Panel?*

(c) Why has the European Communities calculated expected future subsidy values up until 2024?

231. The United States provides a consolidated comment on the parts of this question. The EC contends that the "updated per-aircraft subsidization data" that it provides in response to this question "continues to support the European Communities' claim of present (and threat of) serious prejudice to its LCA-related interests."[399] To the contrary, the updated per-plane magnitude calculations underscore the flaws in the EC's serious prejudice arguments.

232. Notably, the "substantial" increase in alleged per-plane subsidy magnitude for the 787 contradicts the EC's erroneous contention that Boeing could know at the time of order the amount of any alleged subsidies related to the aircraft at the date of delivery and thereby factor that knowledge into its pricing.[400] Further, the ITR's magnitude calculations rest upon fundamental errors relating to subsidy magnitude; the very notion that alleged subsidies that are not tied to specific LCA sales can, for purposes of assessing these effects, be assigned a per

[399] EC RPQ 378, para. 265.

[400] *Cf.* EC RPQ 372, para. 264.

aircraft basis using a convention developed for purposes of assessing countervailing duties; and to specific distortions produced by the EC's per-plane calculations.

233. Before reaching the EC's per-plane subsidy magnitude calculations, the Panel must first arrive at an accurate calculation of any subsidies it finds. Obviously, if the EC's alleged subsidy amounts are grossly overstated – and the evidence shows they are – then the EC's alleged per-plane *ad valorem* subsidization data are worthless.

234. Next, if more than one measure has been found to be a subsidy, the Panel should properly arrange its serious prejudice analysis by conducting an aggregate analysis of those subsidies that have "a sufficient nexus with the subsidized product and the particular effects-related variable under examination,"[401] while avoiding aggregation of subsidies that are "of a different nature, and thus effect, than the other . . . subsidies."[402] In this dispute, there is a bright-line distinction between the alleged recurring subsidies (principally FSC/ETI and the Washington State and Everett B&O tax measures) and all other subsidies.[403] The EC alleges that subsidies in the former category are recurring, such that they "reduce Boeing's marginal cost," while those in the latter category are non-recurring and allegedly "increase Boeing's non-operating cash flow."[404] This categorical distinction is made by the EC's own consultants, ITR[405] and Professor Cabral.[406] The United States agrees that subsidies tied to the production or sale of a particular product are most certainly "of a different nature, and thus effect" than subsidies that may provide general funds to the beneficiary but that are not tied to the production or sale of the same product.[407]

235. Accordingly, any non-recurring subsidies found to exist should, in the Panel's analysis of serious prejudice, be analyzed – and their magnitudes assessed – separately from any recurring subsidies found to exist. This is particularly important considering that the significance of a subsidy's magnitude will depend in large part on its nature and the condition of the recipient. If two different subsidies provide benefits of identical dollar amounts, but one subsidy is contingent on the production or sale of particular aircraft, while the other provides nothing more than untied cash to a recipient with ready access to alternative sources of capital, the former is far more likely to affect product pricing. Further, any non-recurring subsidy amount will be an absolute

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[401] *US – Cotton Subsidies* (Panel), para. 7.1192.

[402] *US – Cotton Subsidies* (Panel), para. 7.1307.

[403] US SNCOS, paras. 139-140.

[404] EC FWS, paras. 1306-1311; ITR Magnitude Report, Appendix A, p. 1 (Exhibit EC-13).

[405] ITR Magnitude Report at Appendix A (Exhibit EC-13).

[406] Cabral Report, p. 1, para. 2 (Exhibit EC-4).

[407] US SNCOS, paras. 139-140.

dollar value, while any recurring subsidy amount can only be appropriately measured as a percentage.[408]

236. Once the alleged recurring subsidies are considered separately, two things are readily apparent. First, the alleged subsidies from FSC/ETI – which represent $2.199 billion of the $2.221 billion total for all alleged recurring subsidies over the 1989-2006 period – are irrelevant, as they have already been the subject of WTO dispute rulings and no longer benefit Boeing.[409] Second, the alleged subsidies attributed to Washington State and City of Everett B&O tax measures are – at two-tenths of one percent *ad valorem* – of insufficient magnitude to materially affect competition between Boeing and Airbus.[410]

237. This leaves the alleged non-recurring subsidies, which consist primarily of challenged R&D programs. The EC's notion that the price and other effects of these subsidies can be assessed by *assuming* that they flow through to Boeing's sales on a per aircraft basis based on the *convention* used to assess countervailing duties has no sound theoretical foundation and is unsupported by evidence.

238. Although the Cabral Report *argues* that Boeing uses a prescribed portion of the alleged subsidies that Professor Cabral characterizes as incremental non-operating cash to invest in "aggressive pricing," there is no support in the record for this basic assumption. Further, his theoretical model is based on economic literature applicable to companies that, unlike Boeing, depend on cash flow to finance their investments because their access to capital markets is constrained.[411]

239. To conduct a meaningful assessment of the magnitude of any non-recurring subsidies the Panel might find, it is vital to consider their nature. As Professors Stiglitz and Greenwald observe, the provision of a given amount of untied cash subsidies is unlikely to affect the product development or pricing of a company like Boeing with ready access to capital markets unless those subsidies were so large that, in their absence, BCA would not have been economically viable.[412]

240. Because this contention has now become the core EC argument, this Panel must assess very carefully the amount and magnitude of any subsidies it might find. Although the SCM Agreement does not require a precise quantification of subsidy magnitude in every instance, careful Panel review of the EC's magnitude calculations are essential in this case because of the weight the EC has put on its "economic viability" argument. The failure of that argument was

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[408] US RPQ 229, paras. 373-378.

[409] US RPQ 369, para. 225; Statement of James H. Zrust (Exhibit US-1341).

[410] US RPQ 229, paras. 374-378.

[411] The U.S. comment on EC RPQ 382 addresses this issue in greater detail.

[412] Stiglitz/Greenwald Statement, pp. 4-5 (Exhibit US-1309).

made clear previously in this proceeding and is confirmed in the U.S. comments on the EC's response to Question 378.

241. Given the aforementioned, fundamental flaws in the EC's magnitude arguments, the more specific failings of ITR's magnitude calculations should be beside the point. They remain glaring, however, if only as an indication of the lengths to which the EC has been willing to go to inflate its alleged *ad valorem* per-plane magnitudes. Specifically, the EC and ITR have

- allocated the alleged subsidies on the basis of "imputed" or "derived" orders, which are not actual orders but actual or estimated deliveries shifted backward in time by three years, so as to artificially inflate the per-plane magnitudes in 2005 and 2006, high order-volume years on which the EC's serious prejudice arguments focus;[413]

- treated alleged recurring subsidies as having been received at the *imputed/derived* time of order (*i.e.*, three years prior to actual or estimated delivery), even though Boeing would not receive the alleged benefit until time of delivery; [414]

- improperly allocated alleged subsidies to Boeing aircraft on the basis of aircraft seats associated with imputed/derived orders, rather than the associated aircraft value;[415]

- treated some alleged subsidies as linked only to the 787 when no such specific link exists;[416] and

- misstated the number of seats that the 787-3 actually has so as to allocate alleged subsidies to the 787-8 and 787-9, which play a larger role in EC arguments.[417]

242. The most egregious of these flaws is the EC's use of imputed/derived order data as the basis its alleged per-plane subsidy allocations. The EC has used as its allocation basis actual deliveries and, for much of the 2004-2006 period, *estimated* future deliveries.[418] The EC has failed to provide a legitimate justification for this approach. [419] Despite insisting that the alleged

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[413] US Comment on EC RPQ 77, paras. 263-267; US RPQ 283, paras. 485-492; US Comment on EC RPQ 277, paras. 494-501.

[414] *Compare* US FWS, para. 816; US Comment on EC RPQ 79, para. 274, *with* ITR Magnitude Report, para. 5 (Exhibit EC-13).

[415] US Comment on EC RPQ 75, para. 259; US RPQ 281, paras. 477-480; US RPQ 282, paras. 481-484.

[416] US FWS, para. 816.

[417] US FWS, para. 816.

[418] ITR Magnitude Report, paras. 33-35 (Exhibit EC-13).

[419] US Comment on EC RPQ 277, para. 495-501.

non-recurring subsidies cause "immediate and direct" price effects on orders in the year the subsidies were allegedly received,[420] the EC's per-plane magnitude allocation methodology matches alleged subsidy magnitude in each year against "orders" that did not actually occur in that year.[421] Thus, even if a per-plane allocation of alleged subsidies were appropriate in this dispute, the EC's allocation method renders its per-plane *ad valorem* subsidy magnitudes analytically useless.

243. As the United States has shown, using actual orders as the allocation basis (and keeping all other aspects of ITR's methodology constant) causes the alleged per-plane magnitudes in 2005 and 2006 to fall by roughly *50 percent*.[422] Using actual orders also causes the alleged per-plane magnitudes in 2004 to surge by 60 to 80 percent,[423] yet 2004 was the year in which Airbus' global market share reached historically unprecedented levels.[424] Thus, the EC's allegations concerning alleged subsidy magnitude – and indeed its entire serious prejudice case – cannot provide a plausible explanation for the pattern of competition between Boeing and Airbus during the 2004-2006 period.

373. How does the European Communities respond to the following arguments made by the United States:

244. The EC begins its response to this question with an introductory statement accusing the United States of taking "too narrow a reading of the scope of 'benefit' under Article 1.1(b) of the SCM Agreement" when it "limits the concept of a 'benefit' to 'monetary' or 'financial' benefits."[425] However, this conclusion is not some misperception by the United States, but a necessary implication of the Appellate Body's finding that:

> there can be no "benefit" to the recipient unless the "financial contribution" makes the recipient "better off" than it would otherwise have been, absent that contribution. In our view, the marketplace provides an appropriate basis for comparison in determining whether a "benefit" has been "conferred", because the trade-distorting potential of a "financial contribution" can be identified by

[420] US Comment on EC RPQ 277, para. 498; EC FWS, para. 1322.

[421] US Comment on EC RPQ 277, para. 496.

[422] US RPQ 283, para. 488-489; Revised ITR Magnitude Calculations Using Actual Orders, Table A (Exhibit US-1308).

[423] US RPQ 283, para. 488-489; Revised ITR Magnitude Calculations Using Actual Orders, Table A (Exhibit US-1308).

[424] US FWS, paras. 1035 and 1071.

[425] EC RPQ 373, para. 270.

> determining whether the recipient has received a "financial contribution" on terms more favourable than those available to the recipient in the market.[426]

In a market transaction the buyer and seller agree to a value-for-value exchange, usually in the form of a price paid for something conferred.[427] The "terms" that the benefit analysis compares are all elements of a market transaction that can be, and in the market routinely are, reduced to a price.

245. Thus, the benefit is at heart financial, a principle reflected by the description of the underlying government transaction as a *financial* contribution. The EC's argument focuses narrowly on the particular item provided by the government in a particular type of financial contribution – in its example, a provision of goods and services. The SCM Agreement, however, takes a broader view. The chapeau over the enumerated list of covered measures describes all four types of measures as "financial contributions". The word "financial" means "of or pertaining to revenue or money matters."[428] Thus, the chapeau indicates that all of the particular types of covered measures are to be viewed in terms of the "financial" value of what was contributed by the government.[429] The contribution is itself financial and, thus, any advantage conferred is also financial.

246. The EC's arguments regarding "technology benefits" confuse the concepts of benefit and effect. Article 6.3 requires an inquiry into whether enumerated market developments are "the effect of the subsidy." As the EC concedes, the "subsidy" for purposes of this analysis consists exclusively of those elements of a financial contribution that confer a "benefit" by making the recipient "better off" than if it had entered into a comparable transaction in the marketplace.[430] If a financial contribution funds research that results in the development of a new technology, that is not part of the "benefit" in the sense of Article 1 of the SCM Agreement because the same project funded from commercial sources would have yielded the same result. However, if the subsidy were "tied" to the technology in the sense that the underlying research would not have occurred absent the subsidy, that technology might still be an "effect" of the subsidy. If a complaining party could then show that the technology was critical to a commercial product, it

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[426] *Canada – Aircraft (AB)*, para. 157.

[427] The Appellate Body has found, albeit in a different context, that the market is "the area of economic activity in which buyers and sellers come together and the forces of supply and demand affect prices." *US – Cotton Subsidies (AB)*, para. 408.

[428] New Shorter Oxford English Dictionary, p. 950.

[429] Similarly, where a government foregoes revenue, it is – as a narrow technical matter – providing nothing to the recipient; yet the EC would presumably not argue that since the government did not provide money, the contribution and benefit could be conceptualized as "nothing".

[430] *Canada – Aircraft (AB)*, para. 157. *See also* EC RPQ 373(b), para. 283 (recognizing that the "benefit of a subsidy is .. measured … in terms of what the recipient got over and above what it could have obtained at market.")

might succeed in establishing that the subsidy was one that, within the Stiglitz/Greenwald framework, created or maintained supply.

247. The EC efforts to "conceptualize" the benefit of a financial contribution as something additional to its financial value is at base an exercise in double counting, which becomes clear when the EC argues for a "technology multiplier." Under this approach, the "benefit" is first calculated in financial terms, and then augmented to reflect "knowledge, experience, and confidence" that the recipient gained while using the government payments, goods, or services. Since the use of any payments, goods, or services resulting from a market transaction is implicit in the transaction, those uses cannot add to the benefit conferred.

248. Furthermore, the flaws in the EC's argument are not cured by its unsupported, single-sentence assertion that "research results that a government shares with one company but not others would constitute a 'financial contribution' on terms more favourable that those available to the recipient at market."[431] The evidence demonstrates, to the contrary, that parties to market transactions do share the results of their earlier work with their research contractors and partners to facilitate the performance of the contract or cooperative work. These market transactions may involve the provision of personnel, data, or intellectual property, and prohibit any additional circulation of those results.[432] NASA, however, does not operate in this manner; the results of its research are generally available. Furthermore, when NASA provides its data and employees to other entities, it – like market providers of such goods and services – is adequately remunerated by the recipient.

249. Thus, the EC's introduction to its theory of "technological benefit" does nothing to situate it within the facts or the law of this case, foreshadowing that the rest of its response will take place outside the bounds of the measures it has challenged and the terms of the SCM Agreement.

(a) It is not necessarily the case that the price effects of an alleged subsidy bear a qualitatively different relationship to the subsidy benefit than any technology effects. Depending on the nature of a subsidy, it may be impossible to separate

[431] EC RPQ 373, para. 271.

[432] Under Contract E, the Parties envisioned that the Parties would perform R&D work together (see Article 8.3 regarding treatment of "Joint Project Intellectual Property") and that the service provider would develop its own knowledge (see Art. 8.2 regarding treatment of "Project Intellectual Property" developed by a single party). See Contract E (Exhibit US-1342(BCI)). Contract between SPACEHAB, Inc., and RSC-Energia, p. 10 (Exhibit EC-1415); Development and Supply Agreement between Thermage, Inc., and Stellartech Research Corp., pp. 5-6, 8, 18, and 37 (Exhibit EC 1416); and Development Agreement between Cox Interactive Media, Inc., and LookSmart, Ltd., pp. 2 and 4 (Exhibit EC-1417). Contracts C and D envisage that performance of the contract would involve the contractor's use of equipment owned by Boeing. Contract C, clause 13a (Exhibit US-1210(BCI)); Contract D, Schedule 1 (Exhibit US-1211(BCI)). The contracts generally provide for protection of confidential information exchanged during the course of the contract. Contract A, p. 4 (Exhibit US-1208); Contract B, clause 10.3 (Exhibit US-1209); Contract C, clause 17 (Exhibit US-1210(BCI)); Contract D, clause 7 (Exhibit US-1211).

allocated price effects from technology effects (US Comments on EC RPQ 275, para. 482)?

250. As the EC offers essentially the same response to part (a) and part (b) of the Panel's question, the United States will offer one set of comments under part (b).

(b) Knowledge, experience and confidence are not the benefit of a subsidy, but are the natural result of engaging in any commercial activity, including R&D (US Comments on EC RPQ 275, para. 484)?

251. The EC uses its response to the various subparts of the Panel's question to set out a theory of a "technological benefit" that goes beyond the boundaries of Article 1.1(b) of the SCM Agreement. It frames its argument as follows:

> {T}he US R&D subsidies provide Boeing with at least two benefits: (i) a direct financial benefit because Boeing did not have to pay for the R&D funded by the US subsidies; and (ii) a technological benefit in the form of technology obtained under US government-supported R&D, including through the advancements in R&D resulting from Boeing personnel's interaction with, and access to, NASA and DoD personnel facilities and databases.[433]

It proposes that the Panel account for the technology effect in the form of either a "multiplier" of any financial effects found to exist,[434] or "the entirety of the knowledge, experience and confidence gained by Boeing engineers."[435] The EC has not demonstrated that the payments, goods, and services involved in its claims actually confer a benefit within the meaning of Article 1.1(b), and there is no basis in the SCM Agreement for creating such a benefit by means of multiplying by something that is not a part of the challenged measures.

252. In constructing this argument, the EC never addresses the question asked by the Panel – whether knowledge, experience, and confidence are the natural result of engaging in any commercial activity, instead of a non-commercial benefit. It simply asserts that it is not challenging "*any* commercial activity" but rather "the very specific knowledge, experience and confidence that Boeing gained from its R&D in collaboration with NASA and DoD engineers."[436] However, the EC's extensive efforts to show that performing research for the

[433] EC RPQ 373, para. 272. There are a few other instances in which the EC seems to acknowledge that the technology "benefit" it is attempting to manufacture is actually a "result" of the R&D-related measures it challenges. For example,, para 284 of EC RPQ 373(b), it states that it "challenges, as the benefit of the US R&D subsidies, the very specific knowledge, experience and confidence that Boeing gained from its R&D in collaboration with NASA and DoD engineers as a result of the US R&D subsidies."

[434] EC RPQ 373(b), para. 287.

[435] EC RPQ 373(b), para. 293.

[436] EC RPQ 373(b), para. 284.

government builds knowledge, experience, and confidence – a point the United States has never disputed – do nothing to show that this knowledge, experience, and confidence is a "term" of a financial contribution that is more favorable than is available in the market.

253. It is also important to remember that the EC is still challenging the same two types of government measure that it addressed in its first written submission: (1) the funds that NASA and DoD pay to Boeing to acquire its research services; and (2) the research-related goods and services that NASA and DoD allegedly provide to Boeing. If the Panel were to find that either measure constitutes a financial contribution, the next question to resolve is whether a "benefit is *thereby* conferred." By the terms of the SCM Agreement, then, the extent of the financial contribution sets the upper bounds of any benefit conferred.

254. The method for calculating the benefit from a government purchase or provision is not "opaque" – it is, as the EC recognizes, to "measure in terms . . . of *what the recipient got* over and above what it could have obtained at market."[437] Or, as the Appellate Body has stated, a benefit arises only where "the recipient has received a *financial contribution* on terms more favourable than those available to the recipient in the market."[438] When that test is applied to the challenged measures, it does not result in the "technological benefit" that the EC proposes.

255. The first form of "technological benefit" that the EC proposes is a multiplication of the alleged less-than-adequate-remuneration that Boeing paid in exchange for government goods and services by the "knowledge, experience and confidence that Boeing engineers gained by undertaking the R&D in cooperation with NASA and DoD engineers."[439] In other words, the EC asks the Panel to: (1) calculate the benefit of funds, goods, and services provided to Boeing according to Articles 1.1(b) and 14 of the SCM Agreement based on the adequacy of the remuneration; and then (2) double count it or multiply that by the amount that Boeing learned *as a result of* performing the challenged research measures. This is simply double counting. Specifically, where NASA[440] provides the services of employees to outside entities, including Boeing, the "cooperation" with those employees *is* the service provided. And contracts submitted by the EC and the United States show that collaboration between the purchaser and supplier of research services is a "term" of such transactions consistent with terms available in the market.[441] Therefore, Boeing is not "better off" as a result of working with NASA engineers

[437] EC RPQ 373(b), para 283 (emphasis added).

[438] *Canada – Aircraft (AB)*, WT/DS70/AB/R, para 140 (emphasis added).

[439] EC RPQ 373, para. 281.

[440] DoD does not have a mechanism like NASA's Space Act Agreements that allows the provision of services to outside entities. The EC has also provided *no* evidence that DoD employees collaborated with Boeing employees in research related to large civil aircraft. US Comment on EC RPQ 354, *supra*.

[441] Under Contract E, the Parties envisioned that the Parties would perform R&D work together (see Article 8.3 regarding treatment of "Joint Project Intellectual Property") and that the service provider would develop its own knowledge (see Art. 8.2 regarding treatment of "Project Intellectual Property" developed by a single party).

than it would by performing comparable work with comparable engineers in the marketplace. As for any knowledge, experience, and confidence that Boeing learns by doing the research, this is the *result* of undertaking the research with the funds, goods, and services provided by the government, just as it would be the result of undertaking research with the same funds, goods, and services received from the market. It is not an element of "financial contribution" and thus it cannot be any part of the "benefit . . . thereby conferred."

256. The second form of "technological benefit" that the EC proposes is based on an assertion that the entire body of "knowledge, experience and confidence" that Boeing gains as a result of undertaking the challenged research constitutes a benefit. As the United States explained in the introduction to this question, this position is inconsistent with the financial nature of the "benefit" under Article 1.1and the fact that the benefit is bounded by the financial contribution actually made. It is also worth noting that the EC's assertions on this point have no basis in the facts. The EC simply asserts that because Boeing "would not have undertaken" the research on its own, the funds, goods, and services provided for that purpose confer a benefit in the form of the knowledge that Boeing gained from performing that research.[442] To the contrary, the United States observes that there is an abundance of evidence that Boeing has conducted massive amounts of research on its own and in cooperation with other non-governmental entities.[443] It also had sufficient capital and access to capital to self-fund all of the challenged research – whether performed in-house, out-of-house, or in a cooperative setting.[444]

(c) The evaluation of the effect of a subsidy must start with the benefit, and may not consider those elements of the financial contribution that do not confer a benefit (US Comments on EC RPQ 286, para. 519)?

257. In response to this part of the Panel's question, the EC concedes that "the evaluation of the effect of a subsidy must start with the benefit that the subsidy confers on a recipient. Indeed, the effect of a subsidy results from the 'benefit,' or 'advantage,' that 'makes the recipient 'better off' than it would otherwise have been."[445] As the United States discussed in its comments under part (b) of this question, the concept of a "technological benefit" is inconsistent with the financial nature of a "benefit" under Article 1.1(b) of the SCM Agreement. Even if the EC could surmount this legal hurdle, it has failed to show that the acquisition of "knowledge, experience

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See Contract E (Exhibit US-1342(BCI)). Contract between SPACEHAB, Inc., and RSC-Energia, p. 10 (Exhibit EC-1415); Development and Supply Agreement between Thermage, Inc., and Stellartech Research Corp., pp. 5-6, 8, 18, and 37 (Exhibit EC 1416); and Development Agreement between Cox Interactive Media, Inc., and LookSmart, Ltd., pp. 2 and 4 (Exhibit EC-1417).

[442] EC RPQ 373, para. 281.

[443] *See generally* Bair Affidavit, (Exhibit US-7).

[444] US Comment on EC RPQ 292, paras. 580-587; US Comment on EC RPQ 378, *infra*; Wessels Economic Viability Report (Exhibit US-1358); Stern Stewart Economic Viability Report (Exhibit US-1357).

[445] EC RPQ 373, para 294, *citing Canada-Aircraft (AB)*, paras 153 and 157.

and confidence" or "technology" that Boeing achieved under the challenged programs was different than what it could have achieved in a market transaction. The United States has also demonstrated that the challenged R&D measures do not confer a "financial benefit" – as the EC calls it – in the form of over- or under-remuneration in comparison to market terms for such transactions.[446] Thus, the EC has provided no basis on which the Panel can find the existence of a subsidy.

258. Finally, to the extent that the Panel were to find the existence of a subsidy, (1) the nature of the subsidy is either funds, goods, and services provided for the purpose of performing fundamental R&D far removed from (and in most cases completely unrelated to) any commercial product, including the 787;[447] (2) the amount received by Boeing is, at most, $775 million in payments over 17 years and $75 million in provision of goods and services;[448] and (3) the government's contribution was provided to a company with more than enough cash to have self-funded the same research, undertaken internally or in cooperation with other entities, and thus gained the same knowledge, experience, and confidence.[449] The EC has used its submission to make a final, but unsustainable, effort to overcome these facts by positing the existence of an additional benefit that has additional effects. Neither the facts of this case nor the terms of the SCM Agreement support that argument.

374. Please explain what the European Communities means by (i) the concept of a subsidy being "tied" to any particular product in the context of the allocation of subsidy amounts discussed in EC RPQ 276 and in Exhibit EC-13; (ii) the concept of a subsidy being "tied" solely to Boeing's 787 in the sense of benefiting solely the 787 (e.g., EC Second Written Submission, paras 697-704) and "tied" to or enabling the launch of Boeing's 787 (e.g., EC Comments on US RPQ 286, para. 483); (iii) the concept of a subsidy that

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[446] EC RPQ 371, para. 261; EC RPQ 373, para. 272.

[447] EC RPQ 371, para. 261. *E.g.*, US FWS, paras 944-946; US FNCOS, para. 57 (NASA Deputy Director of Aeronautics Research explaining that "{NASA's} aeronautics research portfolios have always been very broad, with emphasis on fundamental research potentially applicable to the widest range of applications, from personal air vehicles to rockets and spacecraft. Many research areas, such as hypersonics and self-healing materials have little relevance today or in the future to large civil aircraft manufacturers. In short, we focus on pre-competitive research, and do not conduct research to develop particular large commercial aircraft models.") US SWS, paras. 168-169, 194, 198-200; US SNCOS, para. 35; US RPQ 87, paras. 19-25; US RPQ 326, paras. 32-34; and Affidavits of Mike Bair, Branko Sarh, Douglas Ball and Alan Miller (Exhibits US-7, US-1254, US-1257, and US-1258).

[448] See US RPQ 343, para. 124.

[449] US Comment on EC RPQ 292, paras. 580-587; US Comment on EC RPQ 378, *infra*; Wessels Economic Viability Report (Exhibit US-1358); Stern Stewart Economic Viability Report (Exhibit US-1357).

The EC has also alleged that DoD provided $2.2 billion in "funding" to Boeing for research into supposed "dual-use" technologies. The United States and the EC agree that DoD purchased military technologies under these programs, and the disagreement between the parties relates primarily to whether DoD paid more than adequate remuneration. Accordingly, the United States has focused the discussion on NASA research contracts in its comments on EC RPQ 371, 373 and 375. If, however, the Panel were to find that DoD paid more than adequate remuneration, the same analysis with respect to the NASA payments would apply.

is not directly "tied" to production or sales volumes of specific aircraft in the context of assessing the effects of those subsidies (e.g. EC First Written Submission, paras. 1309, 1311; EC RPQ 274 paras. 482-483); (iv) the concept of a "development subsidy" as used by Professor Cabral in Exhibit EC-4? What is the relationship between the various senses in which the European Communities uses the concept of "tie" in its submissions?

259. In its response to Question 374, the EC explains that it considers a subsidy to be "tied . . . where it is directed at specific products" and "untied where it is not directed at a particular product."[450] The EC goes on to affirm that "the vast amount of the 'development' subsidies Professor Cabral assesses are untied funds."[451]

260. This response is important to the Panel's assessment of the EC's causation theories because, as Professors Stiglitz and Greenwald state, the effects of subsidies on prices and competition are likely to be greatest where the subsidies in question either create supply or maintain supply that would not otherwise exist and/or reduce a producer's marginal costs of producing a particular product. Subsidies that are tied to the development, production, or sale of a particular product are likely to be supply-creating or supply-maintaining. By contrast, subsidies that are not tied to the development, production, or sale of a particular product are far less likely to be supply creating or supply maintaining.

261. By its own admission, therefore, the bulk of the alleged subsidies about which the EC complains are, under the "broad contours" of the Stiglitz/Greenwald Statement endorsed by the EC, unlikely to affect competition or prices in the large civil aircraft market. The EC attempts to place them into the supply creating/supply maintaining category by arguing that the amount and magnitudes of the alleged subsidies are so large that, "but for" them Boeing would not be a viable competitor. But the EC's "economic viability" argument is, for the reasons stated in the U.S. comments on the EC's answer to Question 378, conceptually flawed, factually wrong, and wholly dependent on a calculation of the amount and magnitudes of the alleged subsidies that has no basis in the facts.

262. The United States takes issue with the EC's characterization of the Advanced Composite Technology ("ACT") Program as tied to the 787. The basis for this characterization is the EC's assertion that this program "researched composite technologies that directly benefited the launch of the 787."[452] In fact, the research performed by Boeing under the ACT Program, which ran from 1989 to 1995, was no more related to the 787, which was launched in 2004, than any of the other NASA programs that the EC has challenged.[453] The work done under the Advanced

[450] EC RPQ 374, para. 298.

[451] EC RPQ 374, para. 306.

[452] EC RPQ 374, para. 302.

[453] As NASA's Deputy Director of Aeronautics Research has explained "{NASA's} aeronautics research portfolios have always been very broad, with emphasis on fundamental research potentially applicable to the widest range of applications, from personal air vehicles to rockets and spacecraft. . . . {W}e focus on pre-competitive

Technology Composite Aircraft Structures ("ATCAS") contract, which is at the core of the EC's allegations regarding the ACT Program,[454] was also too fundamental, and ultimately too outdated and too unrelated to the design parameters of the 787, to have "directly benefited" that product – either "solely," as the EC argues, or as one of many products.[455] Thus, it did not create or maintain supply of any product.

263. In the situation of ATCAS, the evidence demonstrates that the results of the research were not ultimately further developed into a commercial product. More generally, when an alleged subsidy takes the form of foundational research, there is unlikely to be a sufficiently direct relationship with a particular product to satisfy the "genuine and substantial relationship of cause and effect" between that research and the development of a particular product needed to support a finding of serious prejudice.

375. How does the European Communities respond to the United States' comment (US Comments on EC RPQ 275, para. 484) that the European Communities had initially argued that the R&D programmes conferred a benefit because they paid for research that Boeing would have had to pay for on its own (and that this was the basis for one of the underpinnings of the European Communities' causation theory; that most of the alleged subsidies operated alike in that they affected Boeing's non-operating cash flow), while in EC RPQ 275, the European Communities has changed its theory to argue that there is a knowledge, experience and confidence effect independent of the alleged magnitude of the subsidy?

264. The U.S. notes that the EC's prior arguments, which it quotes back to the Panel in its response to this question, address the "effects" of the measures it has challenged.[456] The EC has previously argued that the alleged subsidy has had two effects – extra cash and knowledge. As the United States has responded, however, the EC's argument that the government provides Boeing with extra cash that it did not have to spend otherwise to perform the research is at odds with its argument that the result of the government research support is knowledge that Boeing would not have otherwise had.[457]

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research, and do not conduct research to develop particular large commercial aircraft models." US SNCOS, para. 57. The list of ACT Program participants, including American Airlines, BASF and Dow Chemical, Bell Helicopter Textron and Sikorsky, Grumman, Lockheed and Northrop, Pratt and Whitney, a variety of universities, the Federal Aviation Administration and the U.S. Air Force, demonstrates the broad applicability of the research done under the program. See US FWS, para. 193(a).

[454] EC FWS, paras. 512-514.

[455] The EC purports to make its case, pages 48-61 and 67-77 of the Wacht Report (Exhibit EC-15). The United States rebuts those arguments in paragraphs 197-200 of its second written submission and in the Affidavit of Alan G. Miller (Exhibit US-1258).

[456] EC RPQ 375, paras 309-314.

[457] US Comments on EC RPQ 275, para. 485; and US Comments on EC RPQ 371, *infra*.

265. As the United States discussed in its comment on the EC response to Question 371, and as Professors Stiglitz and Greenwald explain, a research subsidy will only have an impact on a company's operations if it is "tied to a supply creating launch decision."[458] Those are not, however, the circumstances before the Panel in this case. To the contrary, the evidence shows that (a) Boeing had sufficient resources to alternatively fund all of the challenged research and (b) none of knowledge it gained in the course of performing the challenged research is tied to the development or production of the 787.

266. In no event, however, can the arguments about the existence of a "technology effect" be construed to imply the existence of the "technology benefit" that the EC now proposes.[459] As the United States discussed in detail in its comments on the EC's responses to Questions 371 and 373, the learning that Boeing develops by performing research with government funds, goods, and services is not the benefit of any alleged financial contribution.

376. The Panel refers to the European Communities' response to Panel Question 279. Does the "first step" of the European Communities' causation argument (EC FNCOS, para. 119, EC RPQ 83(c), para. 368), depend on the Panel's acceptance of the European Communities' calculations of the amount and magnitudes of the subsidies at issue in this dispute?

267. The EC's answer to Question 376 discusses "three independent bases" that the EC says support its contention that the alleged subsidies caused Boeing's aggressive reference period pricing. The first is statements by U.S. government officials and Boeing executives. The second is the "economic evidence" of the Cabral Report. And the third is the "financial evidence" from Boeing's own financial reports. The EC concedes that its "financial evidence," *i.e.*, its claim that "but for" the alleged subsidies, Boeing would not be a viable competitor in the LCA market, is dependent on its magnitude calculation, but denies that the other "independent" bases share the same dependency. The facts say otherwise.

268. The "economic evidence" on which the EC bases its causation argument is the Cabral Report. Its central thesis is that Boeing "invests" its free cash in aggressive pricing (as well as product development and distributions to shareholders) because it has a powerful incentive to do so – *i.e.* "aggressive pricing" is a sound economic choice. The United States has criticized the

[458] Stiglitz/Greenwald Statement, p. 3 (Exhibit US-1309) ("Payments for basic research activities unrelated to the development of particular products … are unlikely to have a decisive impact on development decision or on the production or sale of aircraft. These technologies may provide a foundation on which a company or, if the results of the research in question are made broadly available, the industry as a whole, can eventually develop new generations of aircraft, but as the subsidies are not tied to a supply creating launch decision, their impact on the market is unlikely to be significant.") and p. 5 ("Finally, there are subsidies to companies that have unfetter access to capital markets that do not reduce the marginal cost of producing or selling a particular product and are untied to any activity or are tied to activity that is not supply creating or supply maintaining. These subsidies are unlikely to affect the recipients' production or pricing decisions.)

[459] EC RPQ 375, paras. 317-319 and EC RPQ 373, paras. 280-282.

structure of Cabral's model and the assumptions on which its output depends at length and in detail.[460] But for purposes of the EC response to this question, the United States assumes, *arguendo*, that the central thesis of the Cabral Report is correct. It necessarily means that because "aggressive pricing" is a sound investment, Boeing would be well-advised to invest in aggressive pricing as long as it has the ability to do so. More specifically, the EC does not argue, and cannot argue, that Boeing needs subsidies to lower its large civil aircraft prices. Rather, the argument must be that Boeing needs the subsidies for economic viability purposes to offset the drop in near term profits resulting from the lower prices. In other words, the pricing argument based on the Cabral Report is a viability argument in exactly the same way as the EC's financial argument is a viability argument. The EC cannot logically maintain that the latter, but not the former, is dependent on calculation of the magnitude of the alleged subsidies.

269. The remaining EC argument linking the alleged subsidies to Boeing's pricing is "the inferences and conclusions that can be drawn" from statements of U.S. government officials and Boeing regarding the price effects of the alleged subsidies. The EC has crafted this part of its argument around (1) occasional broad statements regarding one (but only one) of the purposes of the Washington State tax programs and one (but only one) of the objectives of NASA's research programs, and (2) a comment by Boeing executives about Boeing's decision to share the benefits of its production efficiency gains with its customers.[461]

270. The United States does not contest the EC's claim that this part of its argument is not dependent on the EC's magnitude calculation, but that is inconsequential. The U.S. government statements relied on by the EC do not even address Boeing's pricing. There is no basis for the assertion that they stand as evidence for the proposition that Boeing uses the alleged subsidies to price its large civil aircraft in a way that it would not otherwise do. The EC may want the Panel to draw such an inference from its selected quotations, but there is no evidentiary basis for doing so. In fact, as the United States has demonstrated in its comment above on the EC response to Question 324, all the *evidence* is against the EC's inference that NASA and DoD research is for the sole purpose of helping the U.S. civil aircraft industry.

271. As for the Boeing statement regarding its willingness to share productivity improvements with its customers, there is a world of difference between the impact on pricing of, on the one hand, a reduction in production costs specific to particular large civil aircraft and, on the other, of alleged subsidies that are not tied to the development, production or sale of any particular large civil aircraft. There is a crucial distinction, articulated by Professors Stiglitz and Greenwald, between the likely price effects of a program that reduces product-specific costs and one that

[460] US FWS, 823-862; US SWS, paras. 178-184; US RPQ 90, para. 224; Comments of Prof. Greenwald, pp. 1-2 (Exhibit US-8); NERA Reply, pp. 5-6, 11 (Exhibit US-3); US RPQ 90, para. 224; US RPQ 95, paras. 242-245; US Comment on EC RPQ 89, paras. 344-347; US Comment on EC RPQ 95, paras. 353-355; US Comment on EC RPQ 98, paras. 364-367; US Comment on EC RPQ 307, paras. 623-628; US Comment on EC RPQ 308, paras. 629-631.

[461] EC RPQ 376, paras. 332-333.

does not.[462] The EC's failure to recognize this critical difference means that it has not yet understood the difference recognized by the Appellate Body in *US – Cotton Subsidies (21.5)(AB)* between subsidies that create or maintain supply and those that do not.[463]

272. The last two paragraphs of the EC's response to this question argue that even if all of its price effects arguments are dependent on its amount/magnitudes of the subsidies calculation, its independent "technology effects" causation argument is not tied to that calculation. This causation theory is wholly without merit, as demonstrated in the U.S. comments on the EC's responses to Questions 371, 373, and 375.

377. Please direct the Panel to the arguments in the submissions of the European Communities and evidence on record demonstrating how the goods and services allegedly provided to Boeing by (i) NASA granting Boeing access to equipment which NASA acquired from entities outside of the US civil aircraft industry; (ii) NASA sharing with Boeing the results of in-house LCA-related R&D; and (iii) NASA making available to Boeing the results of NASA-sponsored R&D conducted by entities such as military aircraft manufacturers and universities, each as identified in EC RPQ 163(d), para. 252, are a source of the "price effects" and/or "technology effects" alleged by the European Communities.

273. The EC begins its response to the Panel's question with the observation that "it makes no practical difference to its argument whether NASA provides goods and services that it produces through "in-house" spending (implicated by scenario (ii) in the current question) or whether NASA acquires those goods and services through "out-of-house" spending (implicated by scenarios (i) and (iii) in the current question). This assertion underscores the EC's systemic failure throughout its NASA allegations to grapple with the evidence. There is a very significant "practical difference" between and among the scenarios laid out by the Panel in that they each require a distinct factual demonstration and distinct legal analysis. Assuming the EC had demonstrated, both as a matter of fact and a matter of law, that all three scenarios occurred and constituted financial contributions within the meaning of Art. 1.1(a)(1)(iii) of the SCM Agreement, it is true that the Panel would assess the benefit from each provision of goods and services in the same manner – by looking at whether the recipient paid adequate remuneration for what it received. But the EC's summary of its evidence demonstrates that is has not established the existence of a provision of goods and services of any sort beyond the $75 million in goods and services that NASA provided directly to Boeing under the Space Act Agreements listed in Exhibit US-1256(revised). The EC's evidence on this point thus supports only a fraction of its $10.4 billion claim of "total support" from NASA.

[462] Stiglitz/Greenwald Statement, pp. 1-2 (Exhibit US-1309).

[463] *US – Cotton Subsidies (21.5) (AB)*, para. 392.

274. To the extent that the citations provided by the EC demonstrate any particular provisions of goods and services, they simply repeat references to the limited amount of goods and services supplied to Boeing pursuant to Space Act Agreements[464]:

- the estimated cost to NASA of goods and services provided under a Space Act Agreement with Boeing related to "blended wing body" research "of high interest within LaRC and the Agency"; 465
- NASA's provision of a computer modeling tool to Boeing under a Space Act Agreement in exchange for testing in various multidisciplinary applications;466
- a list of the non-reimbursable Space Act Agreements to which the EC has limited its challenge;467 and
- copies of particular Space Act Agreements submitted by the EC.468

The EC has argued that the alleged provision of goods and services accounts for the gap between its $10.4 billion "total support" allegation and the $775 million maximum value of NASA's research contracts with NASA under the challenged programs. In fact, the EC's own evidence demonstrates what the U.S. has explained – specifically, that NASA provided only $75 million of goods and services to Boeing under Space Act Agreements. This evidence provides no basis for increasing the $775 million maximum value of contracts by $9.6 billion.

275. The EC's list of citations also contains a limited number of references to goods and services made available to Boeing to perform work under a small number of NASA contracts. The only specific examples are:

- access to government computers for the purpose of performing work under Contracts NAS2-14096, NAS2-14090, and NAS2-14091,469

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[464] *E.g.*, ECSWS, para. 389-90 and EC RPQ 148, para. 190. The United States has identified all of the Space Act Agreements under the challenged programs at US-74 and has provided almost all of those Agreements, including at Exhibit US-70(BCI), US-109(BCI), US-111, US-112(BCI), US-113(BCI), US-120(BCI), US-122(BCI), Exhibits US499-526. The goods and services provided to Boeing pursuant to Space Act Agreements between Boeing and NASA under the challenged programs have a total value of $75 million. Exhibit US-1256(revised) and US Comment on EC RQP 172, paras. 298-303.

[465] EC FWS para. 650, n. 1071. *See also* US FWS, para. 260.

[466] EC FWS, para 588, n. 958 and Exhibit EC-381. *See also* US FWS, para. 260, noting that Boeing's participation in the HPCC program was almost entirely limited to this single Space Act Agreement.

[467] EC RPQ 158, para 240.

[468] Exhibits EC-381, EC-614, EC-615, EC-616 and EC-617.

[469] Exhibits US-529(HSBI), US-567(HSBI), and US-569(HSBI).

- composites stitching machines and other equipment provided under Contract NAS1-20546,470
- computer modeling software, hardware and wind-tunnel testing time provided in the context of QTD-2 contract;[471] and
- a solicitation for work related to air traffic systems that indicates that "{t}he Contractor shall provide the personnel materials and facilities – in addition to those that may be provided by systems research."[472]

All of this evidence makes clear that the government furnished these goods and facilities for the purpose of performing the work required under the contract, not providing these goods to the recipient within the meaning of Article 1.1(a)(1)(iii) of the SCM Agreement. Nevertheless, the EC repeats this limited set of allegations throughout its submissions.[473] The evidence demonstrates that these goods and services advanced the work requested by NASA, and conferred no benefit (or financial contribution) on Boeing. But in any event, this small set of examples clearly does not justify increasing the $775 million maximum value of contracts by $9.6 billion.

276. The EC's list also contains examples attempting to show provision of goods and services that are not tied to any legal document or particularized facts. For example, the EC notes an article in a NASA newsletter about a computational fluid dynamics code called OVERFLOW.[474] NASA developed OVERFLOW, and makes it generally available to enterprises located in the

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[470] Exhibit EC-324.

[471] EC FWS, para. 614-15, 618, n. 1020. See also US FWS, para. 258.

[472] Exhibit EC-613, p. 30. The statement of work on which this solicitation is based also demonstrates the type of general research that NASA performs, to no particular advantage of Boeing. Specifically, it calls for a:

> research and technology effort established to improve the operational efficiency and safety of transport aircraft operating in the National Airspace System and to foster the integration of aircraft and air traffic control developments. The research results and the technology developed is transferred to the user community. This program provides for flight systems research that will enable the user of current derivative and new generation transport aircraft to operate more effectively in the presence of air traffic control constraints traffic congestion flight hazards and noise.

Ibid.

[473] EC FWS, paras 890-901; EC SWS, paras. 385-409; EC RPQ 148, para. 189; and EC RPQ 169, paras. 282-285.

[474] EC FWS, paras. 586-87

United States.[475] When NASA provides its codes particularly to Boeing for research purposes, it memorializes the transactions in Space Act Agreements.[476]

277. Similarly, the EC cites to a document in which NASA requests money from Congress and a generic High Speed Research Program planning document, which reference no particular goods or services provided by NASA.[477] Nonetheless, the EC insists that these documents prove that the entire HSR Program was a provision of goods and services because "Boeing, of course, was the only US entity capable of building an {High Speed Commercial Transport}."[478] It makes this allegation contrary to the evidence that NASA made only limited provisions of goods and services to Boeing that are memorialized in Space Act Agreements. The EC also disregards the fact that the HSR Program involved significant participation by industry, academia, and other government agencies.[479] This evidence does not justify the treatment of the entire program as a provision of goods and services within the meaning of Article 1.1(a)(1)(iii) to the U.S. civil aircraft industry alone.

278. Finally, the EC cites argumentation that references no particular goods or services, but instead, defends its methodology for attributing a large share of NASA expenditures to Boeing based on its (incorrectly calculated) share of the U.S. industry producing civil aircraft and parts. The EC argues, without regard to what entity received the funds, that all of the aeronautics research that NASA funded (with a few inadequate exceptions) is potentially "related to" commercial aircraft, and therefore should be assumed to be almost exclusively a provision of funds, goods, and services to Boeing.[480] These calculations, based on a series of assumptions about how NASA spends its money, are not *evidence* of anything, and certainly do not establish that the provided goods or services to Boeing. The United States has shown that this methodology is inconsistent even with the evidence put forward by the EC,[481] and has also provided evidence as to the nature and value of the small volume of goods and services that NASA did provide to Boeing in exchange for adequate remuneration.[482]

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[475] *List of OVERFLOW Users* (Exhibit US-1270). Circulation of OVERFLOW outside of the United States is controlled for national security purposes under U.S. law.

[476] *E.g.*, Exhibit EC-381, discussed supra.

[477] EC RQP 148, para. 190, *citing* Exhibits EC-1367 and EC-1208.

[478] EC RPQ 148, para 190.

[479] US FWS, para. 193(b).

[480] EC FWS, paras. 548, 572, 603, and 631, EC RPQ 148, para. 169-195, EC RPQ 164, para. 269; and EC RPQ 168, paras. 279-281,

[481] US RPQ 343, paras. 124-140.

[482] Exhibit US-74; *Value of NASA Facilities, Equipment, and Employees Under Selected Space Act Agreements* Exhibit US-1256(revised); *Data on the estimated price reports taken from NASA's TechTrackS system* (Exhibit US-1357(BCI).

279. The evidence and argumentation that the alleged provisions of goods and services "are a source of the 'price effects' and/or 'technology effects" alleged by the European Communities" is even thinner than the listed support for its attempt to transmute $75 million in goods and services into $9.6 billion. The EC cites to no evidence regarding its price effect theory. Prof. Cabral did include the alleged value of provision of goods and services in his model.[483] That model, however, does not "link" provisions of goods and services to adverse effects. It simply treats all measures, including the provisions of goods and services, as cash to Boeing, undifferentiated from any other alleged financial contributions. As the United States has explained elsewhere, Prof. Cabral's model has no credibility, as it relies on invalid assumptions about how Boeing and the large civil aircraft market operate.[484]

280. The EC has made a variety of arguments intended to show that NASA does research that is related to commercial aircraft. However, those arguments do not support its "technology effects" theory that the "goods and services {NASA provides} contributed to Boeing's ability to secure the launch of the innovative 787 in 2004, years earlier than would have been possible without the subsidies."[485]

281. The core of the EC's attempt to demonstrate a causal link between NASA and the timing of the 787 launch is set out by Airbus engineer Dominik Wacht, whose statement, submitted as Exhibit EC-15, also forms the basis for the EC's arguments in Annex C of its first written submission. Wacht reviews the published results of the research Boeing performed for NASA and attempts to match up designs and processes used in that foundational research with designs and processes used a decade later on the 787. Boeing's engineers have explained that Wacht is wrong. In particular, he misperceives similarities where, in fact, the NASA research differed in critical respects from what Boeing has used for the 787.[486] Moreover, his efforts do nothing to demonstrate that "but for" the alleged subsidies, Boeing would have failed to fund the research that led to the technologies in question.

282. The analyses cited by the EC fail to address the Panel's question in another regard – they do not mention the provisions of goods and services for which the EC provided evidence. Thus, the "evidence" provided does not answer the Panel's request for evidence to support a link between the NASA's provision of goods and services and the technology effect that the EC alleges such contributions have. Rather, the Wacht Report and Annex C of the EC's first submission lay bare the fact that the EC's technology effects argument is based on nothing more

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[483] Exhibit EC-4.

[484] US FWS, 823-862; US SWS, paras. 178-184; US RPQ 90, para. 224; Comments of Prof. Greenwald, pp. 1-2 (Exhibit US-8); NERA Reply, pp. 5-6, 11 (Exhibit US-3); US RPQ 90, para. 224; US RPQ 95, paras. 242-245; US Comment on EC RPQ 89, paras. 344-347; US Comment on EC RPQ 95, paras. 353-355; US Comment on EC RPQ 98, paras. 364-367; US Comment on EC RPQ 307, paras. 623-628; US Comment on EC RPQ 308, paras. 629-631.

[485] EC RPQ 377, para. 346.

[486] *E.g.*, Miller Affidavit (Exhibit US-1258).

than a statement of the obvious – that NASA research related to aeronautics and Boeing builds airplanes. To the extent that the EC has tried to make a tighter connection (i.e., a connection of the sort that would have to be demonstrated to satisfy the "but for" causation test on which the parties have agreed), it has failed.

283. The rest of the argument and evidence in the EC's list provides no saving support for its assertion that NASA's provisions of goods and services to Boeing enabled the launch of the 787. For example, in para. 149 of its comments on US RPQ 159, the EC argues that the OVERFLOW computational fluid dynamics code made generally available to U.S. industry saves Boeing money in developing its aircraft. But the article behind the cover graphic that EC features prominently in the body of its text makes clear that this financial savings relate to Boeing's ability to run the code on in-house "workstation cluster", rather than paying the high cost of renting time on external supercomputers.[487] There is no suggestion that the code represents technology that enabled the earlier launch of the 787; it is just a matter of money (and not much), not technology.

284. Similarly, the EC argues that "composite technologies {were} developed by NASA for the 787's wings and fuselage."[488] But Exhibit EC-297, which it cites as support for this argument, demonstrates no such thing. Rather, that exhibit – consisting of a NASA official's testimony before the U.S. Congress – demonstrates that NASA does research to develop technologies that advance the state of aeronautics, that the results of that research are available for use on all "virtually all aircraft flying today", that one general area in which NASA has performed research is composites, and the 787 will use composites.[489] This statement provides no evidence of a particular good or service that NASA provided to Boeing under one of the challenged programs, no evidence that the research NASA performed regarding composites is in fact related to the composites technologies being utilized on the 787, and no evidence that, "but for" the work funded by NASA, Boeing would not have otherwise been able to launch the 787.

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[487] Exhibit EC-378.

[488] EC FWS, para. 483.

[489] NASA's Administrator stated:

> Virtually every airplane flying today employs technological innovations developed by NASA. Examples include the high-bypass turbine engine that provides much greater fuel efficiency and lower noise emissions than original 1960's-era jet engines; "fly-by-wire" control systems that use computers and wires instead of heavy, maintenance-intensive hydraulics systems to control an airplane's rudder and wing flaps; flight management systems such as the "black boxes" that continuously monitor an aircraft's engines, speed, location, and other critical parameters; and advanced composites made out of materials such a graphite and epoxy that can be used to replace heavier and more maintenance-intensive aluminum alloy structures. The Boeing 787, now under development, will be the first large civil aircraft to use composite materials in its fuselage.

Exhibit EC-297. *See also* USSNCOS, para. 41.

285. As for the question of how Boeing developed the technologies that "enabled" the launch of the 787, the answer is provided by the manager of the program at the time – specifically, the massive investment of Boeing and its suppliers.[490] What Boeing has received from NASA under the programs challenged by the EC – whether in the form of goods and services or contract funding – is too little, too foundational, and too unrelated to the 787 to have been the cause of its launch. Airbus has stated that it cannot use the results of NASA research to build aircraft; neither can Boeing.

378. How does the European Communities respond to US Comments on EC RPQ 292, and Exhibits US-1324 and US-1321?

286. The EC concedes that BCA's 2004-2006 product development and pricing decisions were profit-maximizing regardless of the existence of any subsidies.[491] Having done so, the EC must show that, absent the alleged subsidies, BCA would have been incapable of acting on its incentive to maximize profits. To this end, the EC has made several attempts at showing that BCA would not been economically viable without the alleged subsidies, such that BCA would have had to change its product development and pricing behavior to remain in business.[492] In its response to Question 378, the EC shows, yet again, that it is either unable or unwilling to address the issue of "BCA's economic viability absent the alleged subsidies" using widely accepted economic principles. Below, the United States demonstrates once again that, absent the alleged subsidies, BCA would have been able to develop and price its aircraft exactly as it did.

Background on BCA's economic viability under a "but for" counterfactual

287. In its response to Question 292, the EC and its consultants, Professor Whitelaw and ITR, attempted to show that BCA would not have been viable over the 1989-2006 period absent the alleged subsidies by comparing BCA's "absent subsidies" return on assets ("ROA", *i.e.*, return on gross (or total) assets) to a weighted average cost of capital ("WACC") calculated by ITR.[493] Professor Whitelaw, in a passage quoted by both the EC and ITR, went so far as to state that,

> based on an analysis of its operating profits, a firm is economically viable if, over the long term, its return on assets exceeds its weighted average cost of capital.[494]

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[490] Bair Affidavit (Exhibit US-7)

[491] EC RPQ 378, para. 412-413.

[492] *E.g.*, EC RPQ 292; ITR Economic Viability Report (Exhibit EC-1393).

[493] EC RPQ 292, para. 651; Whitelaw Economic Viability Report at 17 (Exhibit EC-1375); ITR Economic Viability Report, para. 4 (quoting Whitelaw on comparing ROA to WACC), Table 1.f (calculating WACC) (Exhibit EC-1393).

[494] Whitelaw Economic Viability Report at 2, para. 2 (Exhibit EC-1375), *quoted in* EC RPQ 292, para. 651 *and* ITR Economic Viability Report para. 4 (Exhibit EC-1393).

288. This ROA/WACC comparison formed the core of the EC's economic viability argument. The problem is that there is no justification for such a comparison. As the United States observed previously, "{b}ecause ROA does not measure the return on capital invested, comparing ROA to WACC, which is after all a company's weighted average *cost of capital*, does not show whether a business is creating value."[495] Rather, as recognized by the textbooks Professor Whitelaw cites and other authorities, the correct metrics for measuring economic viability are (a) return on invested capital ("ROIC") compared to WACC, and, even more appropriate for a business like BCA, (b) economic profit (Economic Value Added or "EVA" is one name for this calculation).[496]

289. In its response to this question, the EC attempts to defend its prior use of ROA/WACC when it states that "ROA is a commonly employed measure" of economic viability. However, it cites no authority for that proposition, and then moves on to a discussion of ROIC.[497] Rather than admit its mistake, however, the EC attempts to explain its abandonment of ROA by stating that:

> ROIC is another commonly employed measure, and is evidently preferred by the United States in this dispute because it usually generates higher returns and, thus, a lower viability threshold. To be conservative, the European Communities employs ROIC in its analysis below. [498]

Once again, the EC misses the point. Choosing between ROA/WACC, on the one hand, and ROIC/WACC or economic profit, on the other, is not a matter of lower vs. higher returns, or aggressive vs. conservative; it is a matter of incorrect vs. correct. That is, if one is measuring economic performance against the cost of capital *to* the business – *i.e.*, WACC – then the proper comparator is the return on capital invested *in* the business – *i.e.*, ROIC or economic profit, *not* ROA.

290. The United States discussed this distinction in its comments on the EC's response to Question 292. The United States also provided calculations of BCA's ROIC and economic profit/EVA for the 1989-2006 period, assuming *arguendo* that, as calculated by ITR, BCA's after-tax operating profit had been reduced by the full amount of subsidies alleged by the EC.[499] In simplified form, the relevant equations are as follows:

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[495] US Comment on EC RPQ 292, para. 574.

[496] US Comment on EC RPQ 292, para. 576-578; *see also* Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) at 4-5 ("Wessels Economic Viability Report") (Exhibit US-1358) (quoting Tim Koller, Marc Goedhart, and David Wessels, Valuation: Measuring and Managing the Value of Companies (4th ed. 2005) at 185; Aswath Damodaran, Investment Valuation (1st ed.)).

[497] EC RPQ 378, para. 355.

[498] EC RPQ 378, para. 355.

[499] US Comment on EC RPQ 292, para. 580-581.

ROIC vs. WACC

ROIC = (BCA "after-tax operating profit less subsidies") ÷ BCA Invested Capital

If ROIC > WACC, the business has created value and is an attractive investment.

Economic Profit/EVA

Economic Profit/EVA = (BCA "after-tax operating profit less subsidies") – (WACC x BCA Invested Capital)

If Economic Profit/EVA is positive, the business has created value and is an attractive investment.

291. For the sake of simplicity, the U.S. calculations accepted *arguendo* the EC's calculation of BCA's "after-tax operating profit less subsidies" and WACC, and calculated BCA's "invested capital" in the most conventional manner: equity + debt, including allocated portions of corporate-level assets and liabilities but excluding corporate-level cash.[500] The result showed that, even under a "but for the alleged subsidies" calculation that accepts *arguendo* the full amount of the alleged subsidies over the 1989-2006 period, BCA's aggregate ROIC was well in excess of its cost of capital, and its economic profit/EVA was positive by a large margin.[501] This confirmed what the United States has maintained throughout this proceeding – that, absent the alleged subsidies, Boeing's large civil aircraft business would have been viable and able to develop and price its aircraft exactly as it did.

Additional expert analysis demonstrates that, but for the alleged subsidies, BCA would have been economically viable

292. To provide further confirmation on this key issue, the United States submitted reports from two leading experts in business valuation and performance measurement: Professor David Wessels of the Wharton School of the University of Pennsylvania, who is also co-author of a widely used valuation text,[502] and Stern Stewart & Co., the applied finance consultancy that developed and pioneered EVA.[503] Each of these experts conducted a more complex analysis

[500] US Comment on EC RPQ 292, paras. 580-581.

[501] US Comment on EC RPQ 292, paras. 580-581.

[502] Wessels Economic Viability Report, pp. 1 n.1 (Exhibit US-1358) (noting that "Valuation: Measuring and Managing the Value of Companies by Tim Koller, Marc Goedhart, and David Wessels is a standard text for valuation and performance management," which "has sold more than 350,000 copies and is currently used in more than 100 universities."), 12 (providing a brief background on Professor Wessels).

[503] Stern Stewart Economic Viability Report, p. 1; *see also* Wessels Economic Viability Report, p. 1 n.2 (noting that the concept of economic profit "was reintroduced in the 1980s by consulting firm Stern Stewart & Co who popularized the term "Economic Value Added" (EVA).").

than that originally submitted by the United States, but each of their ultimate conclusions are the same as that reached in the original U.S. analysis:

- The original U.S. analysis concluded that "investors would have judged Boeing's civil aircraft business to be an attractive investment, even if BCA's operating profit is artificially reduced by the greatly exaggerated value of the alleged subsidies advanced by the EC."[504]

- Professor Wessels concludes that, "we believe BCA would be economically viable (and even attractive) regardless of the alleged provision of subsidies."[505]

- Stern Stewart concludes that "over the 1989-2006 period, BCA would have been a value-creating, economically viable business even if its operating profit had been lower by the amount of the subsidies alleged by the European Communities ("EC")."[506]

Comparison of Methodologies in the U.S. Economic Viability Analyses

293. All three analyses are similar in key respects. Specifically:

- All three, for the sake of argument, reduce BCA's after-tax operating profit by the full amount of the alleged subsidies as calculated by the EC and ITR (including by stripping out any FSC/ETI benefits),[507] despite the fact that these alleged subsidy amounts are unsupported by credible evidence.

- All three, to simplify the analysis, allocate a portion of certain Boeing corporate-level items to BCA's operating profit and invested capital using ITR's revenue-based allocation factor,[508] despite the fact that ITR's revenue-based allocation is "overly simplistic," as Professor Wessels notes.[509]

[504] US Comment on EC RPQ 292, para. 583.

[505] Wessels Economic Viability Report, p. 1 (Exhibit US-1358).

[506] Stern Stewart Economic Viability Report, p. 1.

[507] US Comment on EC RPQ 292, paras. 580-581; Wessels Economic Viability Report, p. 4 (Exhibit US-1358); Stern Stewart Economic Viability Report, p. 3, para. 4.

[508] US Comment on EC RPQ 292, paras. 580; Wessels Economic Viability Report, p. 6 (Exhibit US-1358); Stern Stewart Economic Viability Report, p. 2, para. 1.

[509] Wessels Economic Viability Report, p. 6 (Exhibit US-1358).

- All three do not include an allocated portion of corporate-level cash in BCA's invested capital, as doing so would distort the analysis.[510]

- All three, to simplify the analysis, use the WACC figures calculated by ITR in Exhibit EC-1393.[511]

294. As noted, however, the Wessels and Stern Stewart analyses differ from the original U.S. analysis on certain issues. Specifically:

- Both Wessels and Stern Stewart calculate economic profit/EVA, but not ROIC. [512] As Stern Stewart explains,

  > The EVA calculation includes the same elements as the ROIC calculation, but the calculations are different, such that EVA produces an absolute dollar amount reflecting the economic profit in excess of the cost of capital employed, while ROIC produces a ratio that must then be compared to the company's WACC to assess economic performance. Using ROIC is problematic for evaluating a business like BCA, which in some years has the benefit of negative capital because customer advance payments and supplier accounts receivable reduces the need to use investors' Capital in running the business. If a negative Capital figure is used in the denominator of the ROIC equation, it incorrectly penalizes the company for a situation that is highly favorable to shareholders: operating the business without using investors' Capital. The EVA equation avoids such a result.[513]

- Both calculate economic profit/EVA for each year and then sum the annual results to arrive at a cumulative economic profit/EVA for the 1989-2006 period,[514] whereas the original U.S. analysis performed a single economic profit/EVA calculation for the entire period.[515]

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[510] US Comment on EC RPQ 292, paras. 579-581; Wessels Economic Viability Report, p. 11 (Exhibit US-1358); Stern Stewart Economic Viability Report, p. 3, para. 6.

[511] US Comment on EC RPQ 292, paras. 580-581; Wessels Economic Viability Report, p. 4 (Exhibit US-1358); Stern Stewart Economic Viability Report, p. 2, para. 1.

[512] Stern Stewart Economic Viability Report, p. 2 (Exhibit US-1359).

[513] Stern Stewart Economic Viability Report, p. 2, para. 2 (Exhibit US-1359); *see also* Wessels Economic Viability Report, p. 2 (Exhibit US-1358).

[514] Wessels Economic Viability Report, pp. 2-3 (Exhibit US-1358); Stern Stewart Economic Viability Report, p. 2, para. 3 (Exhibit US-1359).

[515] US Comment on EC RPQ 292, para. 580.

- Both calculated BCA after-tax operating profit for a given year by using the BCA segment data reported in that year,[516] whereas the original U.S. analysis used the cumulative figure calculated by ITR in Exhibit EC-1393 that reflects restated BCA segment data.[517] As Stern Stewart explains,

  > On several occasions between 1989 and 2006, The Boeing Corporation restated historical segment profits following corporate reorganizations and changes in accounting policy to enhance performance comparability on a going-forward basis. Such restatements lack economic substance, and therefore we apply the original reported BCA segment operating profit in our analysis.[518]

  On this point, Professor Wessels notes that, while it does not properly reflect underlying performance, using restated BCA segment data does not materially change the outcome of his analysis.[519]

- Both excluded data for 1997 from the analysis, consistent with ITR's assessment in Exhibit EC-1393 that data for that year reflect "unusual 'one-off' events that artificially reduced returns,"[520] but, to be conservative, both analyses included BCA's poor results from 1995.[521] By contrast, both 1995 and 1997 data were excluded from the original U.S. analysis, which used ITR's cumulative after-tax operating profit figure that excluded both years.[522]

- Both adjusted BCA's after-tax operating profit for employee pension and retiree health care plan service costs (*i.e.*, those employee retirement costs related to the

[516] Wessels Economic Viability Report, p. 3 (Exhibit US-1358); Stern Stewart Economic Viability Report, p. 3, para. 5 (Exhibit US-1359).

[517] US Comment on EC RPQ 292, para. 580; *see also* ITR Economic Viability Report, Table 1(a) (Exhibit EC-1393).

[518] Stern Stewart Economic Viability Report, p. 3, para. 5 (Exhibit US-1359).

[519] Wessels Economic Viability Report, p. 3 n.3 (Exhibit US-1358).

[520] Wessels Economic Viability Report, p. 3 n.3 (Exhibit US-1358) (quoting ITR Economic Viability Report at 4-5 n.12 (Exhibit EC-1393)).

[521] Wessels Economic Viability Report, p. 4 n.4 (Exhibit US-1358); Stern Stewart Economic Viability Report, p. 2, para. 1 (Exhibit US-1359).

[522] US Comment on EC RPQ 292, para. 580; *see also* ITR Economic Viability Report, Table 1(a) (Exhibit EC-1393).

> business's operations),[523] and adjusted BCA's invested capital by treating unfunded pension and retiree care plan liabilities as debt equivalents. [524]

295. Only one difference of note exists between the Wessels and Stern Stewart analyses, that of taxes reflected in BCA's "after-tax operating profit less subsidies." For simplicity's sake, Stern Stewart took as a given the ITR tax rates used in Exhibit EC-1393, which are effective tax rates.[525] By contrast, Professor Wessels applied the proper tax treatment (*i.e.*, the operating tax rate: marginal tax rate times adjusted EBITA, plus any tax adjustments), noting that the use of an effective tax rate is incorrect because "you cannot apply percentage computed by one denominator (earnings before taxes) and apply them to another (earnings before interest and taxes)."[526] The ultimate effect of the difference in tax treatments is relatively small, however, as noted below.

Results of the Wessels and Stern Stewart Economic Viability Analyses

296. Professor Wessels calculates BCA's cumulative "economic profit less alleged subsidies" for the 1989-2006 period to be $1.639 billion, observing that "BCA not only earned a fair return, but exceeded expectations by more than $1.6 billion dollars."[527] Professor Wessels also adjusted the data to account for inflation and noted that doing so causes the cumulative economic profit rises to $1.739 billion.[528] He concludes that,

> {W}e have used well-documented techniques to determine the cumulative economic profit for BCA. In summary, we believe BCA has created more than $1.6 billion in economic profit, even after subtracting alleged subsidies and eliminating FSC benefits. Given this strong performance, we believe BCA would be economically viable . . . .[529]

297. Similarly, Stern Stewart, which uses the term "EVA" for its economic profit metric, calculates BCA's cumulative "EVA less alleged subsidies" at $1.611 billion and notes that "BCA's resulting cumulative EVA over the period is comfortably positive." [530] (The $28 million

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[523] Wessels Economic Viability Report, p. 7 (Exhibit US-1358); Stern Stewart Economic Viability Report, p. 4, paras. 7-8 (Exhibit US-1359).

[524] Wessels Economic Viability Report, pp. 11-12 (Exhibit US-1358); Stern Stewart Economic Viability Report, p. 4, paras. 7-8 (Exhibit US-1359).

[525] Stern Stewart Economic Viability Report, p. 2, para. 1 (Exhibit US-1359).

[526] Wessels Economic Viability Report, p. 9 (Exhibit US-1358); *ibid.*, pp. 8, 10.

[527] Wessels Economic Viability Report, p. 4 (Exhibit US-1358).

[528] Wessels Economic Viability Report, pp. 1, 4, Exhibit 1.1 (Exhibit US-1358).

[529] Wessels Economic Viability Report, p. 12 (Exhibit US-1358).

[530] Stern Stewart Economic Viability Report, p. 3, para. 6 (Exhibit US-1359).

difference with Professor Wessels' cumulative figure results from the different tax treatments noted above.) Stern Stewart's conclusion makes the following points:

> EVA is the soundest metric for evaluating economic performance and long-term viability. . . .Long-term EVA performance analysis can be used to assess the degree of economic viability of a given company, and there can be little doubt that a company with positive cumulative EVA over a period of many years has been economically viable. [531]
>
> {O}ver the 1989-2006 period, BCA would have been a value-creating, economically viable business even if its operating profit had been lower by the amount of the subsidies alleged by the {EC}.[532]

298. These opinions from two experts on valuation and performance measurement leave no doubt that Boeing's large civil aircraft business would have been viable absent the full amount of the alleged subsidies.

The EC and ITR's Revised Economic Viability Analysis Fails

299. The EC has continued its search for a credible means of showing that BCA would not be viable without the alleged subsidies. In its response to Question 378, the EC submits another economic viability report from ITR, this one entitled "BCA's Return on Invested Capital" ("ITR ROIC Report").[533] Significant errors occur throughout the ITR ROIC Report and the related work on pension and healthcare adjustments by Prof. Zarowin.[534]

300. The EC submits the ITR ROIC Report as a purported correction of errors in the original U.S. economic viability analysis.[535] Below, the United States reviews each alleged error and demonstrates that the EC has not undermined the proposition that that BCA would have been economically viable absent the full amount of the alleged subsidies. At the outset, the United States observes that the most robust economic viability analyses on the record are the reports of Professor Wessels and Stern Stewart. In this connection, the United States is submitting two commentaries, each assessing one of those reports in terms of the EC's criticisms (the U.S. Commentary on the ITR ROIC and Wessels Economic Viability Reports ("Annex A") and the

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[531] Stern Stewart Economic Viability Report, p. 4-5, para. 9 (Exhibit US-1359).

[532] Stern Stewart Economic Viability Report, p. 1 (Exhibit US-1359).

[533] ITR ROIC Report (Exhibit EC-1429).

[534] *Cf.* Declaration of Paul Zarowin (Exhibit EC-1431).

[535] EC RPQ 378, para. 357-358.

U.S. Commentary on the ITR ROIC and Stern Stewart Economic Viability Reports ("Annex B").[536]

301. **Allocation of Corporate Overhead to BCA.** The EC complains that corporate overhead costs should be allocated to BCA when calculating its after-tax operating profit.[537] In fact, this allocation *was* made in the original U.S. analysis, the Wessels analysis, and the Stern Stewart analysis, and in each, it was made using the revenue-based allocation factors calculated by ITR in Exhibit EC-1393.[538]

302. **Using After-Tax Operating Profit.** The EC argues that "operating profit accurately captures profitability" and should be the used in measuring returns.[539] Yet, after-tax operating profit *was* used in the original U.S. analysis, the Wessels analysis, and the Stern Stewart analysis.[540]

303. **Adjusting for Inflation.** The EC cites "Professor Whitelaw's observation that inflation results in overstated operating earnings."[541] Regardless, under both the Wessels and Stern Stewart economic profit/EVA calculations, BCA's cumulative "economic profit less subsidies" is positive in both nominal and inflation-adjusted dollars. [542]

304. **Exclusion of Corporate Cash from BCA's Invested Capital.** As discussed above, all three economic viability analyses submitted by the United States exclude corporate-level cash from BCA's invested capital. The EC argues that an allocated portion of corporate cash should be included,[543] but it is mistaken on this point. The EC itself admits that the "usual practice" is

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[536] Comments on "BCA's Return on Invested Capital" by ITR and "The Economic Viability of Boeing's Commercial Aircraft Division" by Professor David Wessels (Annex A) ("Annex A"); Comments on "BCA's Return on Invested Capital" by ITR and "Comments on Economic Viability Analysis" by Stern Stewart & Co. (Annex B) ("Annex B"). Given the late stage of this proceeding, the United States considered that additional expert reports were not necessary. Accordingly, the United States submits the attached commentaries in lieu of reports from experts.

[537] EC RPQ 378, paras. 361-364.

[538] US Comment on EC RPQ 292, paras. 580; Wessels Economic Viability Report, p. 6 (Exhibit US-1358); Stern Stewart Economic Viability Report, p. 2, para. 1 (Exhibit US-1359).

[539] EC RPQ 378, paras. 389-395.

[540] US Comment on EC RPQ 292, paras. 580-581; Wessels Economic Viability Report, pp. 2-3 (Exhibit US-1358); Stern Stewart Economic Viability Report, p. 2 and Table 1A (Exhibit US-1359).

[541] EC RPQ 378, para. 399.

[542] Wessels Economic Viability Report, pp. 1, 4, Exhibit 1.1 (Exhibit US-1358); Annex A, p. 11; Annex B, Table 1C.

[543] EC RPQ 378, paras. 370-373.

to exclude excess cash from invested capital,[544] and this is indeed the consensus view in the relevant literature.[545]

305. In terms of how this issue applies to the assessment of BCA's economic viability, Prof. Wessels observes that:

> Highly liquid safe assets like excess cash typically have extremely different risk profiles than the underlying operating assets included in invested capital. Therefore, invested capital and excess cash should not be commingled. Highly liquid excess cash earns a low ROIC, but also has a low cost of capital. Given the competitiveness of cash markets, economic profit is likely zero. Therefore, excess cash can be ignored in the analysis.[546]

306. While admitting that excluding excess cash would be justified, the EC nevertheless argues that an allocated portion of corporate cash should be included in BCA's invested capital on the theory that Boeing's average balance of corporate cash "reflects the amount that management deems necessary for Boeing's operations."[547] Referencing ITR's own calculations, Stern Stewart explains why such an adjustment would be incorrect:

> BCA has been a consistent generator of free cash flow and contributor to corporate coffers between 1989 and 2006, providing over $11 billion to The Boeing Company (ITR-April 10, 2008, Table 3.a.). In all likelihood, The Boeing Company has relied on BCA to subsidize and provide liquidity to other operating units. According to ITR-April 10, 2008, Table 3.a., over the 18 years being considered, BCA generated over $11 billion of cash in total, and BCA generated positive free cash flow in 12 of those 18 years (if we exclude 1995 and 1997, as discussed, BCA generated positive free cash flow in 11 of 16 years). Had BCA been operating as a stand-alone entity, it might have returned most or all of this cash to investors through share repurchases, dividends, and/or debt repayments, in order to carry only the amount of operating cash necessary to fund its business. We can think of some or all of this cash, sent by BCA to corporate to fund non-BCA-related activities, as a return of Capital to BCA's investors. *A revenue allocation of corporate cash would unfairly burden BCA with excess Capital for*

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[544] EC RPQ 378, para. 371.

[545] Koller, Goedhart, and Wessels, Valuation: Measuring and Managing the Value of Companies (McKinsey & Co., 4th ed. 2005), p. 171 (Exhibit US-1360) ("Do not include excess cash in invested capital."); Jason L. Wolin and Steven Klopukh, *Integrating EVA into the Portfolio Management Process*, in Value-Based Metrics: Foundations and Practice, p. 148 (Frank Fabozzi and James Grant eds., 2000) (Exhibit US-1361) ("{W}e subtract excess cash from capital."); *see also* Aswath Damodaran, *Return on Capital (ROC), Return on Invested Capital (ROIC), and Return on Equity (ROE): Measurement and Implications* 9-10 (Exhibit US-1362).

[546] Wessels Economic Viability Report, p. 11 (Exhibit US-1358).

[547] EC RPQ 378, para. 373.

> *these reasons, in addition to the fact that corporate Cash includes cash on BCA's balance sheet already being accounted for. Given its role as a consistent cash generator for other Boeing operating units, we assign no corporate cash and marketable securities to BCA.*[548]

The EC also argues that, if corporate cash is to be excluded from invested capital, then Boeing's WACC should be increased "to reflect the risk of Boeing's operating assets excluding cash."[549] Annex B notes that ITR's own ROIC calculations do not make this adjustment where doing so would be appropriate.[550] The U.S. Commentary on the Wessels Report *does* make this adjustment, and BCA's cumulative economic profit remains comfortably positive.[551]

307. The only valid point made in the EC's entire discussion of economic viability is that, if cash is excluded, then earnings should not reflect an allocated portion of corporate-level interest income.[552] Making this adjustment does not, however, materially change the outcome of the economic viability analysis: economic profit would decrease but remain well above the return required by investors.[553]

308. **Customer Advances**. The EC argues that customer advance payments on aircraft purchases should be included in BCA's invested capital on the basis that they are a form of financing with an implicit interest cost, the idea being that if Boeing did not receive advance payments, it could charge higher prices on its aircraft.[554] Consequently, the ITR ROIC Report contains dozens of pages of worksheets attempting to implement this adjustment. All this work was unnecessary, however. When implemented correctly, including customer advances in invested capital has no effect on economic profit/EVA because the resulting increase in invested capital is exactly offset by an increase in operating profit reflecting the higher aircraft prices charged on an after-tax basis.[555] The EC and ITR perform the adjustment incorrectly in that they artificially reduce the additional operating profit BCA would earn if it decided to increase prices to compensate for the higher cost of capital resulting from not having customer advances. No rational firm would eliminate a customer financing program unless the cost of foregoing prepaid terms were at least exactly offset by the higher price charged on an after-tax basis.[556] Because of its neutral effect when performed correctly and the amount of unnecessary work involved, there

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[548] Stern Stewart Economic Viability Report, p. 3, para. 6 (Exhibit US-1359) (emphasis added).

[549] EC RPQ 378, para. 367.

[550] Annex B, p. 2, para. 2.

[551] Annex A, pp. 10-11.

[552] EC RPQ 378, para. 367.

[553] Annex A, pp. 10-11; Annex B, p. 4, para. 6 and Table 1C.

[554] EC RPQ 378, para. 386-388.

[555] Annex B, para. 3.

[556] Annex B, p. 3, para. 3.

is no point in making this adjustment. The EC and ITR errors on this issue understate BCA's economic profitability by $4 billion.[557]

309. **Pension and Retiree Healthcare Costs and Liabilities.** As discussed, both Wessels and Stern Stewart adjusted their economic profit/EVA calculations for the costs BCA's operations incur in extending pension and retiree healthcare benefits to employees. The EC (and ITR and Professor Zarowin) argue for a different type of pension and healthcare adjustment, but these are badly flawed in concept and implementation.

310. First, the EC argues that retirement funds' stock market gains and losses should be included in calculating BCA's operating performance.[558] To the contrary, the widely accepted principle is that the performance of a business unit (such as BCA) in a multi-unit company should be evaluated separately from other business units (such as Boeing's Network and Space Systems unit), such that strong performance by Network and Space Systems should not affect an assessment of whether BCA is doing a good job of building and selling commercial aircraft. [559] A retirement fund is the equivalent of another business unit; it is run by investment professionals and overseen by a board of trustees, not BCA. Accordingly, if the fund's investment professionals do well or poorly at picking stocks, this performance should not be attributed to BCA.[560] This is not to say that BCA's operations have no economic exposure to the retirement benefits BCA offers its employees, but this exposure is properly reflected in the retirement plan service costs that Professor Wessels and Stern Stewart included in their calculations. [561] Nor is there any basis for the EC and Professor Zarowin's assertion that a retirement plan's stock market gains and losses would affect Boeing's viability.[562] When stock markets plunged in 2001 and 2002, Boeing's retirement funds declined in value, yet Boeing's credit rating remained several notches above investment grade. [563] Put simply, BCA's economic viability should be assessed on the basis of its operating results and the expectations investors have for those results, not the performance of investment professionals managing retirement funds. The EC's error on this point understates BCA's economic profitability by $3.7 billion.[564]

311. Second, the EC commits a number of implementation errors when it attempts to increase invested capital to reflect underfunded pension and retiree health care obligations. A detailed exposition of these errors is provided in Annex A, but the United States summarizes briefly here.

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[557] Annex A, pp. 1 and 8-10.

[558] EC RPQ 378, para. 381-385.

[559] Annex A, pp. 3-4.

[560] Annex A, pp. 3-4.

[561] Annex A, p. 4; Annex B, pp. 4-5, para. 7.

[562] *Cf.* EC RPQ 378, para. 381.

[563] Annex B, pp. 4-5, para. 7.

[564] Annex A, p. 5.

If underfunded retirement liabilities are treated as a debt equivalent to be included in invested capital, this must be done using the "financing method" for calculating invested capital (*i.e.*, debt plus equity = invested capital).[565] The financing method must always yield the same invested capital figure as the "operating method" for calculating invested capital (*i.e.*, operating assets minus operating liabilities = invested capital).[566] The EC, however, improperly included underfunded retirement liabilities in the operating method calculation, despite the fact that such liabilities are neither operating assets nor operating liabilities. These errors understate BCA's economic profitability by $5.4 billion.[567]

312. **Using Restated Data.** As Professor Wessels and Stern Stewart discussed in their viability reports, restated data for BCA's operations do not properly reflect its underlying performance.[568] The ITR ROIC Report improperly used restated data and thereby understated BCA's after-tax operating profitability by $2.5 billion.[569]

313. **Tax calculations.** Compared to ITR's earlier "return on assets" report that used effective tax rates, the ITR ROIC Report was something of an improvement in that it used an operating tax (*i.e.*, a marginal tax rate) on BCA's operating profit. The ITR ROIC Report fails, however, to include other operating taxes, such as R&D credits.[570] This error understates BCA's after-tax operating profitability by $940 million.[571]

Conclusion

314. Correction of the EC and ITR errors described above turns the negative $10 billion EVA figure in the ITR ROIC Report into *positive $4.3 billion*.[572] As the Panel is aware, there are numerous adjustments to be made in properly measuring a business's economic viability. Some of these adjustments can be complex. In all material respects, the ITR ROIC Report fails to apply basic valuation concepts and misapplies the concepts it does use. By contrast, the Wessels and Stern Stewart Reports are robust opinions by leading experts. Both reach the same conclusion that the United States demonstrated long ago – that Boeing would have been a viable, value-creating business over the 1989-2006 period even if its operating profit were reduced by the full amount of the alleged subsidies. These conclusions remain valid if one makes the two

[565] Annex A, pp. 5-8.

[566] Annex A, pp.5-8.

[567] Annex A., p. 8.

[568] Wessels Economic Viability Report, p. 3 (Exhibit US-1358); Stern Stewart Economic Viability Report, p. 3, para. 5 (Exhibit US-1359).

[569] Annex A, p. 2

[570] Annex A, p. 3.

[571] Annex A, p. 3.

[572] Annex A at pp. 2, 10.

additional adjustments discussed above as being potentially appropriate – excluding cash from the calculation of WACC, and excluding an allocated share of Boeing's corporate interest income from BCA's operating profit. When both adjustments are applied to the Wessels calculations, BCA would have achieved a return comfortably above that required by investors; cumulative economic profit would be $645 million in nominal dollars and $457 million in inflation-adjusted dollars.[573] Annex B applied only the interest income adjustment to the Stern Stewart calculation, but the results are not materially different; EVA is positive by $619 million in nominal dollars and $338 million in inflation-adjusted dollars.[574] At this point in the proceeding, there should be no doubt that, even in the absence of any or all of the alleged subsidies, BCA would have been able to price the 787, 737, and 777, and develop the 787, as it did.

379. Is the European Communities aware of any "analysis that distinguishes the effects on the LCA market of the different types of programs that governments have used to support their aerospace industries" (Statement of Professors Stiglitz and Greenwald, On the Question of the Impact of Subsidies on Supply and Prices in the LCA Market, Exhibit US-1309)? Does the European Communities agree with the explanation of the impact of the various different types of subsidies on competition and on market pricing in the LCA market submitted by the United States in Exhibit US-1309?

315. In response to this question, the EC admits that it, like the United States, is unaware of any analysis that distinguishes the effects on the large civil aircraft market of different types of government support for manufacturers.[575] However, while expressing "some reservations about aspects of Greenwald's and Stiglitz's way of categorizing subsidies and their ranking of results contained in the report,"[576] the EC "generally concurs with {their} basic categories of subsidies."[577]

316. More specifically, the EC agrees with Stiglitz/Greenwald that subsidies have "the most dramatic effect on competitors if the recipient would be commercially non-viable without the subsidies." It also agrees that subsidies that allow a recipient to bring a new model large civil aircraft to market that would otherwise not be introduced also have an impact on supply, and therefore on competition, as do subsidies that "reduce the marginal costs of per unit production."[578]

[573] Annex A at 10-11.

[574] Annex B at Table 1C.

[575] EC RPQ 379, para. 417.

[576] EC RPQ 379, para. 419.

[577] EC RPQ 379, para. 425.

[578] EC RPQ 379, para. 432.

317. The EC offers "four further, more specific, comments with respect to Greenwald's and Stiglitz's proposed ranking of subsidies along the effects continuum."[579] First, the EC notes that the ranking is not exhaustive.[580] Second, it notes that there is significant overlap in the effect of different subsidy types.[581] Third, the EC notes that the ranking is ordinal, not cardinal.[582] And fourth, the EC "re-emphasizes that the authors do not rule out effects from their fourth category," – subsidies to companies that have unfettered access to capital markets and do not reduce the marginal cost of producing or selling a particular product and are untied to any activity that is supply creating or maintaining.[583]

318. In sum, most of the quarrels that the EC has with the Stiglitz/Greenwald Statement are very much at the margins of the authors' analysis. The EC explicitly endorses "the broad contours of Greenwald and Stiglitz's typology of subsidies" and "their general ranking of effects from subsidies" as a "generally usable" approach to the question of determining the effects of subsidies to large civil aircraft producers on competition in the market.[584]

319. The EC is selective, however, in declining to endorse the Stiglitz/Greenwald Statement where it is unfavorable to the EC's serious prejudice arguments. Regarding Stiglitz and Greenwald's conclusion that untied research subsidies are unlikely to have price effects, the EC asserts that "Professor Cabral's economic model has shown that R&D subsidies are essentially fungible with free cash flow and thus have a significant effect on the recipient's investment behaviour, and consequently on the output and pricing of the recipient."[585] To the contrary, Professor Cabral's model *showed* no such thing. Rather, the Cabral model *assumes* that Boeing's access to capital is constrained, and, on that basis, *assumes further* that Boeing's investment levels would necessarily rise if its marginal cash flow increased.[586]

320. These are invalid assumptions to make about a company like Boeing, which faces no significant financing constraints. As Stiglitz and Greenwald observe,

> subsidies to companies that have unfettered access to capital markets that do not reduce the marginal cost of producing or selling a particular product and are untied to any activity or are tied to activity that is not supply creating or supply

[579] EC RPQ 379, para. 433.

[580] EC RPQ 379, para. 434.

[581] EC RPQ 379, para. 435.

[582] EC RPQ 379, para. 436.

[583] EC RPQ 379, para. 436.

[584] EC RPQ 379, para. 452.

[585] EC RPQ, 379, para. 442.

[586] Jordan and Dorman Reply to Cabral Report, pp. 5-6 (Exhibit US-3) (emphasis added).

> maintaining … are unlikely to affect the recipients' production and pricing decisions.[587]

321. In response, the EC cites Professor Cabral in arguing that "'unfettered access' to capital and equity markets is a fiction,"[588] and that "even those companies that have a relatively comfortable financial cushion, with a solid credit rating and good access to external funds, do use additional free cash flow to invest in R&D and aggressive pricing."[589] The EC is incorrect. The EC's position that a company like Boeing would be sensitive to marginal increases in cash flow is contradicted by the economic literature, including empirical research. Professor Greenwald observes with respect to Cabral's stipulation that increases in Boeing's cash flow will lead to higher levels of investment that,

> The critical assumption is that of unconstrained access to capital. *Markets may be imperfect and firms may make less than optimal decisions, but as long as firms have largely unconstrained access to capital, non-specific subsidies which amount to fixed transfers – the kind of subsidy at issue in the Cabral Report – will not affect firm investment decisions*. Funds that flow from transfers will merely substitute for funds that flow from other sources – most obviously borrowing – and investment decisions will be unaffected. Cabral simply assumes when he writes his overall investment constraint – that investment plus dividends must be less than subsidies plus other sources of funds – that other sources of funds are fixed and cannot be increased at essentially constant cost by borrowing in financial markets. *For a company like Boeing, with relatively little debt which regularly repurchases large amounts of its stock, it should be obvious that no such constraint exists*.
>
> In defense of his assumptions, Professor Cabral cites a paper by Blinder, et al., which is representative of an extensive literature that he claims supports his position. *In fact, the empirical literature generally concludes that while many firms are constrained in their access to capital, and do adjust investment levels in response to current cash flows, firms like Boeing with low debt levels and high dividend/share repurchase levels are not*. The threshold question – whether there would have been anything different about Boeing's production and sale of large commercial aircraft, if it had not received the subsidy funds – must, absent Cabral's fantastical central assumption, be answered by his own admission in the negative.[590]

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[587] Stiglitz/Greenwald Statement, pp. 4-5 (Exhibit US-1309).

[588] EC RPQ, 379, para. 446.

[589] EC RPQ 379, para. 447.

[590] Greenwald Comments on Cabral Report, pp. 1-2 (Exhibit US-8) (emphasis added).

Doctors Jordan and Dorman echo Professor Greenwald's critique, noting further that, even for financially constrained firms, the connection between changes in cash flow and investment behavior is ambiguous:

> Although Professor Cabral claims that his model is consistent with the empirical evidence about firm investment behavior, his summary of the evidence is incomplete and his interpretation is flawed. He claims that ". . . increases in cash flow lead to a higher level of investment." {Cabral Report ¶25.} This statement refers to internal cash flow, i.e., cash flow that does not depend on access to external financing. *This is not what the research shows. There is a theory that increases in cash flow lead to more investment for financially constrained firms, which are firms that have restricted access to external financing, but empirical evidence on this theory has produced ambiguous results.* Some studies have found a correlation between changes in internal cash flow and investment spending, and the correlation depends on the existence and degree of financial constraint. Other studies have cast doubt on these results because of difficulties in reliably identifying financially constrained firms and the possibility that cash flow and investing are correlated not because of financial constraints, but because both are affected by the firm's investment opportunities. *Professor Cabral conducts no empirical tests of whether subsidies are correlated with increases in investment for Boeing, and whether this is due to financial constraints or other factors. Instead, he simply assumes that subsidies must increase Boeing's investment spending.*[591]

In sum, the absence of significant financial constraints for Boeing is real, not fictional. Contrary to Professor Cabral's untested assumption, the provision of unrestricted cash subsidies to Boeing would not lead to an increase in "investment" in aggressive pricing and research. Accordingly, the EC cannot refute the conclusion of Professors Stiglitz and Greenwald that unrestricted cash subsidies – which, according to the EC, constitute the bulk of the alleged subsidies – are unlikely to affect a producer's production or pricing if provided to a company like Boeing.

322. Similarly, the EC cannot substantiate its argument that "absent the US subsidies, Boeing would not have 'unfettered access' to capital markets."[592] The EC cites to its "economic viability" arguments in its response to Question 292, but those arguments are premised on an incorrect comparison of Boeing's "but for" return on gross assets to its cost of capital. If one applies the correct economic profit metric, there can be no legitimate contention that, but for the alleged subsidies, Boeing's access to capital would have been significantly constrained. As

[591] Jordan and Dorman Reply to Cabral Report, pp. 5-6 (Exhibit US-3) (emphasis added).

[592] EC RPQ 379, para. 448.

Professor David Wessels of the University of Pennsylvania's Wharton School concludes, "BCA would be economically viable (and even attractive) regardless of the provision of subsidies."[593]

380. Is the Panel correct in assuming, in light of EC Comments on US RPQ 286, particularly at paras. 478-481, that the European Communities considers that (i) all of the alleged US subsidies at issue in this dispute fall into the category of subsidies identified by Professors Stiglitz and Greenwald in Exhibit US-1309 as "so substantial that, 'but for' it, the recipient would not be a viable competitor in the market at issue" on the basis of their alleged cumulative magnitude; (ii) the alleged US R&D subsidies fall within the category of subsidies identified in Exhibit US-1309 as "product-specific subsidies and/or unrestricted subsidies without which particular product lines would not exist or would be significantly different in their scope"; and (iii) alleged subsidies that affect Boeing's marginal unit costs fall within the category of subsidies identified in Exhibit US-1309 as "subsidies that either by providing marginal incentives to increase market production or, in the case of unrestricted subsidies, by relaxing funds availability and risk constraints, affect price outputs and sales decisions at the margin"?

323. In its answer to Question 380, the EC takes its endorsement of the Stiglitz/Greenwald Statement a step further when it tries to fit its various "but for" serious prejudice causation theories into a Stiglitz/Greenwald framework. The effort is a failure.

324. Under the Stiglitz/Greenwald framework, the EC's first causation theory, *i.e.*, that "but for" the alleged subsidies Boeing would not be a viable competitor in the large civil aircraft market, fails both in concept and on the facts. The EC's conceptual problem stems from its effort to use the Appellate Body's findings in *US –Cotton Subsidies (21.5)* to make its economic viability case. The EC equates Boeing, which it concedes is, and has long been, profitable even if the alleged subsidies are deducted from operating income,[594] with U.S. cotton farmers that "but for" the subsidies, would have been facing a "significant gap" between their costs and their market revenues.[595] The economic viability of a company that is profitable even without the alleged subsidies depends more on its prospects going forward than its past performance. For the EC to base a large part of its adverse effects case on the proposition that, over the period 2004-2006, a demonstrably profitable Boeing could not have priced its large civil aircraft in what was a demonstrably profit- maximizing way exposes the fundamental weakness in the case the EC is trying to make.

325. The EC's factual problem is two-fold. First, as the EC concedes in its answer to Question 376, its economic viability calculation depends on its amount/magnitude of the subsidies

[593] Wessels Economic Viability Report, p. 1 (Exhibit US-1358).

[594] ITR Economic Viability Report, Table 1(a) (Exhibit EC-1393) (calculating BCA's cumulative after-tax operating profit for the 1989-2006 period to be $6.695 billion).

[595] EC RPQ 378, paras. 403-410; EC RPQ 380, para. 458.

allegation.[596] Thus, even if the Panel were to find subsidies to Boeing, but at a lower aggregate amount than the EC calculates, the EC's argument disintegrates.

326. Second, the EC's calculation of Boeing's economic viability is wrong, as the expert opinions of both Professor David Wessels and Stern Stewart & Co. demonstrate.[597] Boeing's large civil aircraft operations have added value over time even when the full amounts of the alleged subsidies are deducted from BCA's revenues. There is, in short, no support for the EC's assertion that "under the counterfactual with no US subsidies," [598] Boeing would not have developed its large civil aircraft and priced them exactly as it did.

327. The EC's second causation theory under the Stiglitz/Greenwald framework is that the subsidies at issue in this dispute are subsidies without which the 787 would not have been launched when and as it was. The EC's error here is its failure to take into account the critical distinction that Professors Stiglitz and Greenwald make between subsidies that are tied to the development, production, and sale of a particular aircraft and support for more basic technology that may or may not provide a foundation for applied R&D.

328. The EC cannot point to any evidence that any of the R&D programs that it claims benefitted the 787 were 787-specific or contingent in any way on Boeing's decision to bring the 787 to market. In fact, the program highlighted by the EC wound down in 1995, long before Boeing was even considering a new aircraft with the size and operating characteristics of the 787. Instead, the EC argues that general research on technologies provided "learning" that Boeing drew upon in its own applied research for the 787. Boeing has explained that it did no such thing.[599] More importantly, as a theoretical matter, foundational research such as NASA conducts does not create particular technologies or products because it is too far removed from the development stage. Professors Stiglitz and Greenwald do not consider these types of programs to be "supply creating or maintaining" and, therefore, fall into the category of programs that are unlikely to affect competition in the large civil aircraft market.[600] The EC simply misreads the Stiglitz/Greenwald Statement when it argues otherwise.

329. By contrast, the United States does not dispute the EC's claims that the FSC and Washington State tax programs challenged by the EC would, if found to be subsidies, fall into the category of "subsidies that provide marginal incentives to increase market production or {otherwise} affect price outputs and sales decisions at the margin." The issues regarding these

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[596] The U.S. comment on the EC response to Question 376 addresses this issue in greater detail.

[597] Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit US-1358); Stern Stewart & Co., Comments on Economic Viability Analysis (July 29, 2009) (Exhibit US-1359).

[598] EC RPQ 379, para. 411.

[599] Bair Affidavit, paras. 38-42.

[600] Stiglitz/Greenwald Statement, p. 3 (Exhibit US-1309).

alleged tax subsidies are not their natures, but their magnitudes: Boeing no longer benefits from the FSC program, and the benefits of Washington State tax programs are inconsequential (*i.e.*, equal to no more than two-tenths of one percent *ad valorem*).

330. There is, however, a significant problem with the EC's effort to fit the alleged research subsidies that, according to the EC, provide Boeing the equivalent of additional free cash flow into the Stiglitz/Greenwald category of subsidies that provide marginal incentives to produce or sell large civil aircraft. The EC itself has admitted that they do not belong. [601] The EC cannot, on the one hand, embrace the "broad contours of Greenwald and Stiglitz's typology of subsidies" and on the other, ignore one of its core tenets – *i.e.*, there is a critical difference between subsidies that are tied to the development, production and/or sale of particular large civil aircraft and subsidies that are the functional equivalents of free cash flow.

331. Lastly, the EC is simply wrong when it argues that "even if the Panel were to disagree with the European Communities . . . and were to find that the majority of the US subsidies do not fall into any of the first three categories of effects ranked in the Stiglitz/Greenwald report," [602] the EC would still prevail in its claims of serious prejudice. As support, the EC cites to the Stiglitz/Greenwald conclusion that:

> subsidies to companies that have unfettered access to capital markets that do not reduce the marginal cost of producing or selling a particular product and are untied to any activity or are tied to activity that is not supply creating or supply maintaining … are *unlikely* to affect the recipients' production and pricing decisions.[603]

332. It is true that the Stiglitz/Greenwald conclusion that this category of subsidies is "unlikely" to affect the recipient's production and pricing decisions is not the same as saying that they "cannot" affect those decisions. But it is equally true that "unlikely" falls well short of the "genuine and substantial" link between subsidies and adverse effects that the SCM Agreement requires. Accordingly, a party challenging a subsidy in this category would need evidence to show that it had an effect greater than an economic analysis would suggest. The EC does not do this.

333. Instead, the EC first challenges the claim that Boeing's access to capital markets is "unfettered" without any evidence other than to assert that "the notion of unfettered access to capital and equity markets is a fiction."[604] According to the relevant economic literature

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[601] EC RPQ 380, para. 466.

[602] EC RPQ 380, para. 469.

[603] Stiglitz/Greenwald Statement, pp. 4-5 (Exhibit US-1309).

[604] EC RPQ 380, para. 471.

(including empirical studies) and the evidence, the EC is wrong.[605] Second, the EC contends that BCA's financial health does not matter because the structure of the large civil aircraft market gives Boeing a "keen interest" in "lower prices" for "market share" gains in any event.[606] But accepting, for the sake of argument, that the EC is correct in identifying this "keen interest," it necessarily follows that if lower prices make sense for business reasons, then Boeing will price accordingly regardless of the alleged subsidies as long as it is able to do so. In other words, the EC's "economic argument" linking the alleged research subsidies to Boeing's pricing is applicable only if Boeing does not have sufficient resources to price at a profit-maximizing level – that is, if it is not viable. And, as discussed, all the evidence before the panel disproves the EC's core "economic viability" argument.

381. How does the European Communities respond to the statements made by the United States at US Comments on EC RPQ 287, paras. 528 and 529 regarding the relative prices of the 787 and 777 compared with the A330, A340 or A350 Original?

334. In both what it says and what it does not say, the EC's response to Question 381 highlights the holes in its serious prejudice case. First, the EC never contests the fact that "prices of Boeing's 787 and 777 have been systematically [***] than those of the A330, A340, or A350 Original."[607]

335. Second, the EC never explains how the alleged subsidies could have been so instrumental in Boeing's ability to price the 787 and 777 as it did if Airbus was able to offer the A330, A340, and A350 Original at [***].

336. Third, the EC does not, and cannot, reconcile the evidence of price trends with its argument that, if only Boeing had increased its 777 prices, Airbus A340 prices would have increased proportionally.[608] In fact, [***]. The EC concedes that "{i}n light of the increases in fuel costs, a drop in A340 prices was to be expected"[609] but fails to cite any persuasive evidence showing *any* connection – much less a "genuine and substantial" link – between A340 prices and the alleged subsidies.

337. Fourth, the EC never provides a plausible explanation for why the A350 Original was plagued by a compromised design. (The United States is unable to comment on price trend data for the A350 Original – which is a defunct program – or for the A350 XWB because the EC never provided any). Throughout this proceeding, the EC has attempted to ignore the far-reaching effects that Airbus' $20 billion-plus commitment to the A380 had on its ability to

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[605] *See infra* US Comment on EC RPQ 382.

[606] EC RPQ 380, para. 472.

[607] *Compare* US Comment on EC RPQ 287, para. 528, *with* EC RPQ 381, para. 481.

[608] *Cf.* EC RPQ 381, para. 482.

[609] EC RPQ 381, para. 482.

develop an all-new mid-size LCA. The EC would have the Panel believe that the alleged subsidies' supposed technology effects are the reason why Boeing was able to offer the 787 in 2004, and that it is mere coincidence that Airbus was able to commit to an all-new, primarily composite mid-size aircraft program (the A350 XWB) in 2006, just as the A380 development spending was winding down. Such a story is improbable, to say the least, and it certainly finds no support in the evidence.[610]

338. Fifth, and finally, the EC's campaign-specific arguments linking the alleged subsidies to lost sales and price suppression (*e.g.*, that "Boeing's ability to offer a final price concession made the difference in winning or losing the sale")[611] rely entirely on the per-plane magnitude calculations, the per-plane price effects calculated by Professor Cabral, and, to some extent, the ITR economic viability "analysis." Because the works by ITR and Professor Cabral do not prove anything,[612] the EC cannot show any connection between the outcome of specific campaigns and the alleged subsidies, let alone the "genuine and substantial" link required by the SCM Agreement.

382. Professor Cabral models product market interaction during the production stage according to the Hotelling model of duopoly competition (Exhibit EC-4, at para. 32). However, Exhibit EC-4 generally does not refer to literature on theories of oligopoly behaviour, which predict different outcomes for the strategic use and impact of subsidies, based on different assumptions regarding the nature of competition in oligopoly. In order to obtain a better sense of the robustness of Professor Cabral's findings in relation to key modelling assumptions, please provide an overview of the relevant literature on oligopoly behaviour and explain how the Cabral model is situated within this literature and to what it extent it builds on, or deviates from, previous studies and for what reasons.

339. This question notes Professor Cabral's use of the Hotelling-type model and asks the EC to place his use of that model in the context of the different models of oligopoly pricing, which predict "different outcomes for the strategic use and impact of subsidies, "based on different assumptions regarding the nature of competition in oligopoly." Before commenting on the EC's response to this question, the United States recalls that the Cabral Report draws on the Hotelling model framework to examine the interaction of Boeing and Airbus pricing, not to model the way in which Boeing uses the alleged subsidies for investment in its pricing and product

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[610] *Cf.* US Comment on EC RPQ 287, para. 530-531.

[611] EC RPQ 381, para. 489.

[612] The United States has explained that ITR economic viability analyses are invalid for a number of reasons expressed. US Comment on EC RPQ 292, paras. 571-585 and US Comment on EC RPQ 378, *supra*. The Cabral Report and model are also invalid. FWS, 823-862; US SWS, paras. 178-184; US RPQ 90, para. 224; Comments of Prof. Greenwald, pp. 1-2 (Exhibit US-8); NERA Reply, pp. 5-6, 11 (Exhibit US-3); US RPQ 90, para. 224; US RPQ 95, paras. 242-245; US Comment on EC RPQ 89, paras. 344-347; US Comment on EC RPQ 95, paras. 353-355; US Comment on EC RPQ 98, paras. 364-367; US Comment on EC RPQ 307, paras. 623-628; US Comment on EC RPQ 308, paras. 629-631.

development, and for shareholder payments. That part of the Cabral Report sets out several demonstrably incorrect premises – that Boeing has limited access to capital markets, that it uses its free cash for only four purposes, and that the Cobb-Douglas function (which assumes fixed allocation between dividends and investment) is appropriate. It then relies on these assumptions to reach a conclusion directly contrary to the facts – that no matter what actual market conditions or its actual uses of cash may be, Boeing always allocates its free cash in fixed proportions among investment in aggressive pricing, investment in product development, and distributions to shareholders.

340. It is important to recognize at the outset how the Cabral model's dependence on a number of invalid assumptions predetermine Cabral's conclusion that the alleged subsidies result in lower Boeing aircraft prices.[613] Of these, the most critical is his assumption that Boeing's access to capital is constrained, such that "increases in cash flow lead to a higher level of investment."[614] That is, Cabral assumes that Boeing's investment behavior is sensitive to marginal increases in cash flow, meaning that Boeing will increase investment whenever it receives additional funds (including alleged non-recurring subsidies). This assumption, however, is contradicted by the relevant economic literature and the evidence. Contrary to the EC's contention that unconstrained access to capital is a "fiction" that exists only in theory,[615] Professor Greenwald observes that,

> The critical assumption {with respect to Cabral's stipulation that increases in Boeing's cash flow will lead to higher levels of investment} is that of unconstrained access to capital. *Markets may be imperfect and firms may make less than optimal decisions, but as long as firms have largely unconstrained access to capital, non-specific subsidies which amount to fixed transfers – the kind of subsidy at issue in the Cabral Report – will not affect firm investment decisions*. Funds that flow from transfers will merely substitute for funds that flow from other sources – most obviously borrowing – and investment decisions will be unaffected. Cabral simply assumes when he writes his overall investment constraint – *i.e.*, that investment plus dividends must be less than subsidies plus other sources of funds – that other sources of funds are fixed and cannot be increased at essentially constant cost by borrowing in financial markets. *For a company like Boeing, with relatively little debt which regularly repurchases large amounts of its stock, it should be obvious that no such constraint exists*.

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[613] US FWS, 823-862; US SWS, paras. 178-184; US RPQ 90, para. 224; Comments of Prof. Greenwald, pp. 1-2 (Exhibit US-8); NERA Reply, pp. 5-6, 11 (Exhibit US-3); US RPQ 90, para. 224; US RPQ 95, paras. 242-245; US Comment on EC RPQ 89, paras. 344-347; US Comment on EC RPQ 95, paras. 353-355; US Comment on EC RPQ 98, paras. 364-367; US Comment on EC RPQ 307, paras. 623-628; US Comment on EC RPQ 308, paras. 629-631.

[614] Cabral Report, para. 25 (Exhibit EC-4).

[615] *Cf.* EC RPQ 379, para. 446.

> In defense of his assumptions, Professor Cabral cites a paper by Blinder, et al., which is representative of an extensive literature that he claims supports his position. *In fact, the empirical literature generally concludes that while many firms are constrained in their access to capital, and do adjust investment levels in response to current cash flows, firms like Boeing with low debt levels and high dividend/share repurchase levels are not*. The threshold question – whether there would have been anything different about Boeing's production and sale of large commercial aircraft, if it had not received the subsidy funds – must, absent Cabral's fantastical central assumption, be answered by his own admission in the negative.[616]

Doctors Jordan and Dorman echo Professor Greenwald's critique, noting further that, *even for financially constrained firms,* the connection between changes in cash flow and investment behavior is ambiguous:

> Although Professor Cabral claims that his model is consistent with the empirical evidence about firm investment behavior, his summary of the evidence is incomplete and his interpretation is flawed. He claims that ". . . increases in cash flow lead to a higher level of investment." {Cabral Report ¶25.} This statement refers to internal cash flow, i.e., cash flow that does not depend on access to external financing. *This is not what the research shows. There is a theory that increases in cash flow lead to more investment for financially constrained firms, which are firms that have restricted access to external financing, but empirical evidence on this theory has produced ambiguous results.* Some studies have found a correlation between changes in internal cash flow and investment spending, and the correlation depends on the existence and degree of financial constraint. Other studies have cast doubt on these results because of difficulties in reliably identifying financially constrained firms and the possibility that cash flow and investing are correlated not because of financial constraints, but because both are affected by the firm's investment opportunities. *Professor Cabral conducts no empirical tests of whether subsidies are correlated with increases in investment for Boeing, and whether this is due to financial constraints or other factors. Instead, he simply assumes that subsidies must increase Boeing's investment spending.*[617]

As if Cabral's original faults were not enough, the EC and Cabral, in responding to Question 382, attempt to compare the Cabral Report favorably to prior economic studies of the large civil aircraft industry on the basis that "none of {those} studies explicitly models the *nexus between subsidies and firm behaviour*. Most contributions reviewed by Professor Cabral model this link *implicitly – i.e.,* they *assume*, rather than demonstrate (or analyse how), that firms use the

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[616] Greenwald Comments on Cabral Report, pp. 1-2 (Exhibit US-8) (emphasis added).

[617] Jordan and Dorman Reply to Cabral Report, pp. 5-6 (Exhibit US-3) (emphasis added).

subsidies received to affect the market."[618] Yet, assuming, rather than demonstrating, the link between subsidies and firm pricing behavior is exactly what Cabral does. Given Cabral's false assumption on this central point, there is no basis for the EC's assertion that "Professor Cabral has accurately represented . . . the impact of US subsidies on Boeing's pricing behavior."[619]

341. Turning to the narrower Hotelling model question posed by Question 382, the EC's response is to submit a paper by Professor Cabral on various models of oligopoly pricing (the "Cabral Literature Review").[620] On the basis of that paper, the EC asserts that "Professor Cabral has accurately represented the nature of duopolistic competition between Boeing and Airbus in the LCA industry and consequently the impact of US subsidies on Boeing's pricing behavior."[621] As stated above, Professor Cabral's model of the nature of competition between Boeing and Airbus is different from his effort to demonstrate the impact of a marginal increase in cash flow (including the alleged subsidies) on Boeing's investment behavior (which Professor Cabral conceives of as including "aggressive pricing"). The defects in Professor Cabral's attempt to model the extent to which the alleged subsidies flow through to Boeing's prices would invalidate the Cabral Report even if Professor Cabral's choice of a Hotelling model were correct.

342. However, Professor Cabral's choice of a Hotelling model for his analysis of duopoly pricing is badly flawed. This becomes clear upon examination of the Cabral Literature Review. As in his prior work in this proceeding, Cabral, in his Literature Review, has obscured the most important issues at stake in the competition between Boeing and Airbus under a welter of extraneous analysis. To see why, it will be useful to begin with an explanation of exactly what the Hotelling model is and then demonstrate why Cabral's version of it is wholly inappropriate to his analysis of the price effects of subsidies.

343. The original Hotelling model is one of spatial locational competition among firms – best imagined as retail firms. Customers are distributed along a line (as if along a street) and firms are differentiated for particular customers by how close they are. Customers are assumed to patronize the firm offering the lowest overall cost, including the cost of travel. If two firms have fixed locations, then each firm faces a demand that depends on the price charged by the other firm. Each firm is assumed to maximize its profits based on the expected price of the competitive firm. The final prices for both firms are those which just fulfill these original expectations, when each firm maximizes profits given those original expectations. If the two firms are located in the same place, then the model collapses to the one that Cabral refers to as Bertrand competition and prices are competitive. If the firms are located at opposite ends of the line (maximum differentiation), then prices are higher. This is what Cabral means when he

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[618] EC RPQ 382, para. 520 (emphasis in original).

[619] EC RPQ 382, para. 528.

[620] Luis Cabral, Investment and Pricing Behavior Model: Literature Review of Theories Dealing with Strategic Interaction in Duopolies (July 2009) (Exhibit EC-1435) ("Cabral Literature Review").

[621] EC RPQ 382, para. 528.

points out that the Hotelling model can produce a range of prices from competitive to monopoly ones.

344. The point of the Hotelling model was not, however, to study price determination. The underlying price dynamics are, as Cabral correctly points out, a simple variation on one-shot Bertrand pricing.[622] The point was to study how firms would choose to locate themselves along the line. It is a model of location decisions, not pricing decisions. In terms of competition between Airbus and Boeing, it is a model of aircraft product choices, not pricing decisions. For pricing decisions, the Hotelling model is far from the best one available.

345. This is apparent from paragraph 20 of the Cabral Literature Review where Professor Cabral concedes that many industries are "customer markets" where suppliers negotiate individually with large customers.[623] Large commercial aircraft is an obvious example. Boeing and Airbus engage in extended negotiations with individual airlines with which they have longstanding experience.

346. Cabral tries to claim that if there is uncertainty about the preferences of individual airlines (equivalent to not knowing where they are located along the line), then these customer markets are equivalent to the Hotelling markets of many small customers who must be dealt with as an undifferentiated whole.[624] This is obviously incorrect. Given their long standing knowledge of each individual airline, neither Boeing nor Airbus is significantly uncertain about their individual preferences.[625] Each has large sales organizations focused on this very information.

347. The more egregious flaw here is in the idea, fundamental to Hotelling/Bertrand pricing, that in these customer markets each competitor makes a single simultaneous price offer.[626] That, however, is not at all how things work in the large civil aircraft market, where there is typically a vigorous sequence of competing price bids.[627] The correct pricing model is, therefore, one of repeated Bertrand competition, a fact Prof. Cabral tries to obscure because the implications are so far different from those of his chosen model.

348. The literature on repeated Bertrand pricing is the literature of super games (*see* Rubenstein or Tirole, which is the standard graduate text on industrial organization; Prof.

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[622] Luis Cabral, Investment and Pricing Behavior Model: Literature Review of Theories Dealing with Strategic Interaction in Duopolies (July 2009), para. 19 (Exhibit EC-1435) ("Cabral Literature Review").

[623] Cabral Literature Review, para. 20 (Exhibit EC-1435).

[624] Cabral Literature Review, para. 20 (Exhibit EC-1435).

[625] Declaration of Rod Muddle, paras. 17, 34, 38, and 48 (Exhibit EC-10); *Cf.* Cabral Literature Review, para. 26 (Exhibit EC-1435).

[626] Cabral Literature Review, para. 30 (Exhibit EC-1435).

[627] Declaration of Rod Muddle, para. 53 (Exhibit EC-10); US FWS, U.S. Campaign Annex, paras. 82-91.

Cabral's citations all seem to come from dated undergraduate texts). It generally concludes that any rational price outcome (from monopoly to competitive) is a possible equilibrium outcome. The actual outcome depends on factors that Prof. Cabral ignores, like the competitive attitudes and cultures of Airbus and Boeing. This is completely at odds with his highly deterministic pricing model.

349. Another critical assumption buried by Prof. Cabral posits that Boeing and Airbus are the only two active agents in the large civil aircraft market.[628] This assumes without discussion that the large airlines who purchase their products are purely passive participants, which is obviously unrealistic.[629]

350. The problems with Professor Cabral's analysis of the nature of Boeing/Airbus competition do not end with his choice of a Hotelling model type. According to the EC, "{u}sing the Hotelling set-up as a methodological basis, Professor Cabral designed a dynamic model of Boeing's behaviour in the LCA {sic} to estimate the effect of subsidies on Boeing's investment decisions and pricing behaviour."[630] The key word in that sentence is "dynamic," a most inappropriate description of Prof. Cabral's model. As Doctors Jordan and Dorman observe, "{t}he Cabral investment model is *static* – the same decision about the use of subsidy cash is made in each and every year no matter what conditions the firm faces."[631] To be very clear, this critique – as with all U.S. critiques of Prof. Cabral's work – does not hold him to an unrealistic standard of replicating exactly the real world in an economic model. Rather, the U.S. criticisms hold Prof. Cabral to the standard of typical economic models of firm investment behavior and find, as the Panel should, that his work sorely lacks the theoretical and empirical rigor that can reasonably be expected. Jordan and Dorman note that the typical models

> are dynamic, which means that firms make investment decisions year by year depending on available funds and investment opportunities, changes in the economic environment such as interest rates, and the impact of past decisions such as borrowing. {. . . .}
>
> These models are designed to be applicable to firms with different degrees of financing constraint, from small, unprofitable firms that have difficulty raising capital to large, mature, profitable firms, such as Boeing, for which financing constraints may be small or non-existent. The degree of financial constraint and

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[628] Cabral Literature Review, paras. 25-29 (Exhibit EC-1435).

[629] Declaration of Rod Muddle, paras. 17 and 53 (Exhibit EC-10)

[630] EC RPQ 382, para. 514.

[631] Jordan and Dorman Reply to Cabral, p. 5 (Exhibit US-3) (emphasis added).

> the implications for firms' investment decisions are then ultimately a matter for empirical study. [632]

By contrast,

> {t}he Cabral investment model is specified as a maximization problem in which firm equity is maximized, but it is an unrealistically restricted problem. The firm gets to make only one decision: the allocation of cash between dividends and investment. [633]

351. Thus, from his initial assumptions, to his choice of a Hotelling model type, to his creation of a narrowly deterministic, static model of Boeing's investment behavior, Cabral has failed to provide any reason to conclude that the alleged subsidies would affect Boeing's product development or pricing behavior.

383. With respect to the sensitivity analysis undertaken by Professor Cabral in Section 5.2 of Exhibit EC-4, it would appear that the results are more sensitive to changes in some parameters than others and that, at least in some cases, the chosen interval for the variation of individual parameter values appears somewhat arbitrary. In addition, with the exception of the lower and higher bound calculations, it appears that the sensitivity of results is tested by varying one parameter while holding all others constant. How would the results of this sensitivity analysis compare with those for a commonly used simulation in which all parameters are varied simultaneously by one or two standard deviations, and a probability distribution of results is provided?

352. Once more, the EC argues that a paper by Professor Cabral – in this case the "Cabral Sensitivity Analyses" – "confirms the European Communities' argument that the US subsidies have shaped Boeing's pricing decisions,"[634] when it does nothing of the sort. In his Sensitivity Analyses, Cabral attempts to show that his original model is robust – *i.e.*, not especially sensitive to the values of the parameters adopted. Cabral uses a "Monte Carlo" analysis in this attempt.[635] Cabral's results are, however, neither surprising nor probative of the ultimate validity of his original model. By allowing each of his model parameters to vary randomly in a normal distribution around his original estimates,[636] it is to be expected that the "bottom line" estimates will also vary in a normal distribution around Cabral's original estimate of total price discounts.

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[632] Jordan and Dorman Reply to Cabral, p. 7 (Exhibit US-3).

[633] Jordan and Dorman Reply to Cabral, p. 7 (Exhibit US-3).

[634] EC RPQ 383, para. 531.

[635] Cabral Sensitivity Analyses, paras. 1-3 (Exhibit EC-1436).

[636] Cabral Sensitivity Analyses, para. 2 (Exhibit EC-1436).

353. Even if Cabral's model is not especially sensitive to the assumed values of the parameters, it does not demonstrate that the model can actually measure or predict the quantitative effect of the alleged non-recurring subsidies on Boeing's aircraft prices. To use a simple analogy, suppose one developed a model to predict how high pigs can fly, based on a variety of data such as the pig's height, length, muscle mass, diet, weather, etc. Imagine that the model predicted the average maximum altitude of pig flight as 300 meters above sea level. After varying the parameters on height, length, diet, weather, etc., and running 1,000 Monte Carlo simulations, suppose that the average model prediction was 297.5 meters above sea level. This does not mean that the model makes good predictions, but only that it is robust with respect to its assumptions. Because the model's key assumption (*i.e.*, that pigs can fly) is false, the model is useless, regardless of the results of any sensitivity analysis.

354. However fanciful the above example might seem, it illustrates the core failing of the Cabral model, a failing that cannot be cured by reference to sensitivity analyses. Cabral makes several key modeling assumptions:

- that Boeing's investment behavior is sensitive to marginal increases in cash flow, such that Boeing will increase investment whenever it receives additional funds (including alleged non-recurring subsidies);
- that Boeing will invest marginal increases in cash flow in fixed proportions among its investment options, regardless of the attractiveness of those investments;
- that Boeing has only four types of investments it can make (shareholder payments, aggressive pricing to realize learning curve efficiencies, aggressive pricing to realize switching cost efficiencies, and product research); and
- that BCA acts upon alleged learning curve and switching cost incentives to "invest" in aggressive pricing.

355. These assumptions are contradicted by economic theory and the evidence on the record.[637] Because these false assumptions dictate the result he purports to prove – that the alleged non-recurring subsidies cause Boeing to lower its LCA prices – the Cabral report and model provide no support whatsoever for the EC's attempt to establish a "genuine and substantial link" between the alleged subsidies and the alleged forms of serious prejudice.

[637] US FWS, 823-862; US SWS, paras. 178-184; US RPQ 90, para. 224; Comments of Prof. Greenwald, pp. 1-2 (Exhibit US-8); NERA Reply, pp. 5-6, 11 (Exhibit US-3); US RPQ 90, para. 224; US RPQ 95, paras. 242-245; US Comment on EC RPQ 89, paras. 344-347; US Comment on EC RPQ 95, paras. 353-355; US Comment on EC RPQ 98, paras. 364-367; US Comment on EC RPQ 307, paras. 623-628; US Comment on EC RPQ 308, paras. 629-631.

384. Please provide an overview of the results of any relevant studies in the fields of public economics and industrial organization that attempt to determine the degree of pass-through of taxes (subsidies) to consumers under different assumptions regarding, inter alia, market structure, shape of the demand schedule, entry/exit conditions and time-frame under consideration. Please indicate where Professor Asker's model (Annex A to Exhibit EC-16) is situated within this literature and the extent to which it builds on and extends previous studies. In addition, please provide any examples of related papers where the strategic interaction of suppliers in oligopolistic settings leads to a higher/lower pass-through compared to a competitive setting. If these papers relate to taxes, please indicate how the results should be interpreted in the case of subsidies; i.e., negative taxes.

356. In a report submitted in response to Question 393,[638] Dr. Dorman and Dr. Terris, reviewed the economic literature in light of the arguments make by the EC and its economist, Prof. Asker, and the alternative theoretical model referred to by the Panel in Question 393, the "monopoly supplier" model. As Dr. Dorman and Dr. Terris explain, the economic literature shows that determining pass through between a supplier and its downstream customer in any specific case requires a complex analysis, taking into account a range of factors including competitive structure, demand and supply characteristics, and cost structure.[639] It is not enough to apply economic models based on hypothetical assumptions about the market that are not supported by the facts. As such, neither the EC/Asker model, nor the Panel's "monopoly supplier" model actually help establish any kind of reasonable estimate of pass through. Instead, explain Dr. Dorman and Dr. Terris, all that the economic literature actually allows us to establish is that pass through of an alleged B&O tax benefit between Washington State suppliers and Boeing would be somewhere between 0 and 100 percent. Building on the report submitted by Dr. Dorman,[640] they provide examples of actual situations where pass through would not exist at all, or would be minimal. Therefore, absent a rigorous analysis of the facts and an explanation as to how they translate in the parameters of an economic analysis, which the EC and Prof. Asker have not provided, their approach does not satisfy the EC's burden of proof with regard to its asserted level of pass through.

357. The EC's response to this question, and its related responses to questions 385, 393, and 394, do not change this conclusion. In fact, the EC's expert does not disagree with most of the key findings reflected in the Dorman and Dorman-Terris reports, and even subscribes to some of them.

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[638] *Economic Models of Subsidy Pass-Through* (Exhibit US-1363) ("Dorman-Terris Report"),

[639] As discussed previously, a pass-through analysis is required in certain situations only, including in the context of a claim under Part III of the SCM Agreement involving a subsidy provided directly to an enterprise that does not make and is not related to a party that makes the product alleged to be causing adverse effects. US FWS, para. 468; US RPQ 137, paras. 104-107.

[640] Gary S. Dorman, *Reply to the Reports of Professors Wachtel and Asker* (July 2, 2007) (Exhibit US-186) ("Dorman Report.").

358. First, in his response to Question 384, Prof. Asker cites almost exactly the same economic literature as Dr. Dorman and Dr. Terris do in their report. This literature, as the Dorman-Terris report explains, shows that different competitive models yield widely different results, and that there are no existing studies that correctly represent the facts of the aerospace supplier markets at issue in this dispute.[641] In other words, actual empirical work is needed to determine how aerospace supplier markets fit into any of the theoretical models.

359. Prof. Asker agrees. With respect to demand curve data, Prof. Asker notes that "any simulation-type model that is constructed using hypothetical demand curves suffers from the same problem: the shape of the hypothetical demand curve pre-determines the answer to the pass-through question".[642] Prof. Asker also states that "{e}stimating the shape of a demand curve to the degree of precision necessary for purposes of plugging it into {the Panel's proposed "monopoly supplier" model} would require very detailed data on prices, quantities and product characteristics."[643] Elsewhere, discussing the possible relevance of studies of other industries, Prof. Asker concludes that "{t}he benefit of being guided by these studies is that they directly map industry structure to pass-through outcome . . . *The drawback is that they require drawing an analogy between one industry and another, and this analogy may be more appropriate in some cases and less so in others.*"[644]

360. Second, despite these clear conclusions from the literature, Prof. Asker attempts to present a theoretical basis for the EC's preferred outcome of 100 percent pass through. To do so, he uses graphic examples that are mathematically impossible and, therefore, incorrect. He presents four figures (Figures 2, 3, 4, and 5) to illustrate the conditions that must exist for pass through to be 100 percent, less than 100 percent, and greater than 100 percent. Of these, Figures 2, 4, and 5 are mathematically impossible because, with a linear demand curve, it is impossible to have equal slopes of demand and marginal revenue or a slope of demand that is steeper than marginal revenue. Indeed, elementary economics textbooks, including the one cited by the Panel itself in Question 393, explain that with a linear demand curve, by definition, "the marginal revenue curve is twice as steep as the demand curve".[645] Prof. Asker himself states:

> Another common approach is to estimate a linear demand curve of the form $y = a - bp$. In this case, and regardless of the estimated values of a and b, this

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[641] Prof. John Asker, *Responses to Questions 384, 385, 393 and 394 from the DS353* Panel, p. 19 ("Asker II") (Exhibit EC-1437) ("Although some studies exist that estimate demand for aircraft (e.g., Benkard 2004)… they all use highly parametric demand specifications that do not even have sufficient flexibility to infer the aspects of the shape of demand that would be of interest here.") Prof. Asker cites *no* studies that discuss aerospace supplier markets.

[642] Asker II, p. 19 (Exhibit EC-1437).

[643] Asker II, p. 18 (Exhibit EC-1437).

[644] Asker II, p. 19-20 (Exhibit EC-1437) (emphasis added).

[645] Varian, Hal (1992), Microeconomic Analysis, 3rd Ed., W.W. Norton and Company, New York, p. 236.

> demand relationship will be a straight line and *the demand curve will have to be flatter than the marginal revenue curve – resulting in less than 100% pass-through.*[646]

The only figure of the four that is mathematically possible (Figure 3) shows pass through of less than 100 percent. Thus, as Prof. Asker himself notes later in his responses: "{i}n this case, and regardless of the estimated values of *a* and b, this demand relationship will be a straight line and the demand curve will have to be flatter than the marginal revenue curve – resulting in less than 100% pass through."[647] Thus, the three scenarios that Prof. Asker presents that result in pass through of 100 percent or more are inconsistent with underlying mathematical principles that Prof. Asker admits are correct.

361. Third, Prof. Asker's attempt to rely on studies of the beer market and certain consumer product markets (televisions, bread, bananas, shampoo, etc.) is equally unconvincing. Prof. Asker himself concedes that these markets do not appropriately reflect actual aerospace supplier markets at issue. In addition to the question which, if any, of the aerospace supplier markets are actually "monopoly supplier" markets, any of the other relevant variables (competitive conditions, shape of demand and supply curves, marginal costs, etc.) will likely differ from one supplier market to the next as well, with significant impact on whether and, if so, how much pass through might actually occur. The United States points again to Prof. Asker's own statement that "drawing an analogy between one industry and another… may be more appropriate in some cases and less so in others."[648] Even so, Prof. Asker continues to rely on studies reflecting market conditions in entirely unrelated markets to "support" his conclusion of 100 percent pass through with respect to the aerospace supplier markets actually involved.

362. Fourth, at no point do the EC or Prof. Asker actually respond to either Dr. Dorman's original criticism of the Asker model, or any of the specific examples cited by the United States of situations in which pass through would be zero percent. Particularly, as Dr. Dorman explained in his initial report and as Dr. Dorman and Dr. Terris discussed in further detail, under the Wachtel-Asker model, if a Washington State supplier, who may receive the alleged subsidy, competes with an out-of-state supplier, who does not, and the former is already the low-cost supplier, he will have no reason to pass through any of the alleged subsidy, and as a profit-maximizer can be expected not to. Similarly, in a monopoly supplier model, such as that suggested by the Panel in Question 393, because aerospace components will often represent only a relatively small portion of the total cost of a finished airplane and are used in fixed proportions (x number of airplane doors per plane), a lower component price would not likely result in any increase in the quantity purchased. A monopoly supplier, in other words, would likely pocket 100 percent of any subsidy because it would gain no additional sales by passing any of it along.

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[646] Asker II, pp. 18-19 (Exhibit EC-1437) (emphasis added).

[647] Asker II, p. 19 (Exhibit EC-1437).

[648] Asker II, p. 20 (Exhibit EC-1437).

The EC and its expert do not actually dispute these facts, let alone provide evidence to rebut them.[649]

363. Finally, Prof. Asker actually acknowledges himself that there are situations in which pass through may be less than 100 percent.[650] Showing that there are some situations in which pass through is 100 percent and some situations in which it is less, as Prof. Asker has done, does not meet the burden of proof to establish that pass through is 100 percent or more, as he asserts.

364. In sum, Prof. Asker devotes 14 pages to defending a pass through of 100 percent (or more) even though he concedes that Dr. Dorman is correct on the critical points. Specifically, Prof. Asker:

(1) acknowledges that the outcome of a pass-through analysis depends on a range of factors (none of which he has actually determined with respect to Boeing's Washington State suppliers);[651]

(2) accepts that different models yield different results (so for a model to yield relevant results, it must be consistent with the specific facts of the case);[652]

(3) acknowledges that there is no existing literature that can be used as a basis for a (conservative) numerical estimate of pass through relevant to the specific facts at issue in this dispute (certain aerospace supplier markets);[653]

(4) accepts that the pass-through outcome may be below 100 percent (and effectively acknowledges that it may be anywhere between zero and greater than 100 percent, by subscribing to the economic concepts on which such an outcome is based);[654] and

(5) neither the EC expert, nor the EC itself anywhere even so much as refer to, let alone rebut, any of the specific examples of zero percent pass through that the United States has provided.

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[649] The United States refers to its comment to the EC's response to Question 385 with respect to the related example the EC's expert discussed there.

[650] More generally, the United States also refers to its comment to the EC's response to Question 393(b) with respect to the availability of evidence.

[651] Asker II, pp. 10-19 (Exhibit EC-1437).

[652] Asker II, pp. 10-19 (Exhibit EC-1437).

[653] Asker II, pp. 19-20 (Exhibit EC-1437).

[654] The U.S. comment on the EC response to Question 385 discusses this point in greater detail.

Thus, the EC's sweeping conclusion that pass through must have been equal to or greater than 100 percent remains entirely unsupported. As Dr. Dorman and Dr. Terris have shown, relying on such an assumption is inconsistent with both the theory and economic literature Prof. Asker himself refers to, and reality in the aerospace supplier markets at issue.

385. In his replies to the reports of Dr. Dorman and Drs. Smith and Brown, Professor Asker appears to acknowledge the possibility of a less than 100 per cent pass-through if "the subsidy has a substantial effect on the relative competitiveness of Washington State suppliers" (Exhibit EC-1174, page 10). Please elaborate on the conditions under which pass-through in competitive markets is less than 100 per cent.

365. The EC's expert, Prof. Asker tries hard to avoid directly answering the Panel's question to elaborate on conditions under which pass through in competitive markets is less than 100 percent. He in fact answers it only with respect to one specific combination of facts (of his own choosing) and then only by stating that he feels he "cannot rule out the possibility that there is less than 100% pass-through" and that he "find{s} it hard to imagine that the net effect would be so strong as to alter the conclusion that 100% or greater pass through would occur."[655]

366. Elsewhere in his answers to the Panel's questions, however, Prof. Asker explicitly confirms his earlier acknowledgement that pass through may be less than 100 percent. Thus, for example, he explicitly states that in a monopoly supplier situation, the "demand relationship will be a straight line and the demand curve will have to be flatter than the marginal revenue curve – resulting in less than 100% pass-through".[656] He also states that "whether a subsidy is passed-through by more or less than 100% depends on the relative slopes of marginal revenue and demand."[657]

367. The example Prof. Asker uses to "support" his 100 percent pass-through assumption is equally telling. Prof. Asker posits two suppliers, A and B, competing in a tender. A bids the lowest input price absent the subsidy and, as a result, will win. If both A and B get the subsidy, A should still win. If only B gets the subsidy, says Prof. Asker, then this "*might* give B an advantage", allowing B to underbid A.[658] But in presenting this argument, Prof. Asker ignores scenarios where these assumptions are minimally different, but with significant consequences for the pass-through analysis.

368. For example, if not B, but A gets the subsidy (in other words, the Washington State supplier is already the low-cost supplier and now receives a subsidy), there is no reason for A, as the low-cost supplier, to pass through any of the subsidy it received because it can already

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[655] Asker II, p. 16 (Exhibit EC-1437).

[656] Asker II, pp. 18-19 (Exhibit EC-1437).

[657] Asker II, pp. 8-9 (Exhibit EC-1437).

[658] Asker II, p. 16 (Exhibit EC-1437) (emphasis added).

underbid B. In other words, A pockets 100 percent of the subsidy and Boeing gets none. If the higher-cost supplier (B) gets the subsidy, but the subsidy merely serves to offset a cost-disadvantage that it would otherwise have, B may still lose out against A in a bidding situation (if the subsidy is not enough to offset the cost disadvantage). But even if B wins, its customer's benefit may be minimal compared to the market situation absent the subsidy (even if B's benefit might be significant) because some (or nearly all) of the subsidy would be retained by B to offset its cost disadvantage relative to A. These are precisely the kinds of scenarios to which Dr. Dorman already pointed in his July 2008 report. The EC and its expert avoid dealing with them, but in doing so continue to fail to explain how they believe a 100 percent pass-through assumption would be justified.

393. *In regard to the United States' criticisms of the analyses undertaken by Professors Wachtel and Asker (US First Written Submission, paras. 470-481) the United States argues that Boeing's suppliers can and do sell to a variety of other entities, both inside and outside the aerospace sector (US First Written Submission, para. 476). Assuming an alternative market structure in which each supplier acts as a monopolist and sells its products to different buyers, including Boeing, the literature on taxation indicates that, in such a setting, (i) the optimal price set by the monopolist always increases with the tax rate, i.e. there is always some pass-through, and (ii) the extent of pass-through critically depends on the shape of the demand curve. (See, e.g., Varian, H., Microeconomic Analysis, 3rd edition, Norton, New York, 1992, page 237.)*

(a) Would the parties agree that analogous results apply in the case of a subsidy (a negative tax), and how would the parties characterize these results?

369. Prof. Asker's response to this question again demonstrates how the EC tries to establish pass through by relying on assumption rather than evidence and actual economic analysis. His actual response appears in the first sentence of his three sentence answer: "Yes, analogous results apply to subsidies (that is, a subsidy is just a negative tax)." Prof. Asker's only explanation of this conclusion is on page 9 of his response to Question 384. There, he states with respect to papers regarding certain specific models of tax incidence that "nothing in these papers makes the analysis substantively different when subsidies are considered, rather than taxes."[659] He provides no citation and offers no further explanation.

370. In its response to this question, the United States referred to the report by Drs. Dorman and Terris of July 29, 2009. In that report, they found that it is not possible to simply assume that analogous pass through results apply in the case of a subsidy and a tax.[660] Subsidies, they say, may affect firms' incentives differently from taxes and it is, therefore, not a foregone

[659] Asker II, p. 9 (Exhibit EC-1437).

[660] Dorman-Terris Report (Exhibit US-1363).

conclusion that the theoretical predictions for taxes and subsidies would be mirror images, particularly in oligopolistic industries where firm behavior may not be symmetric.[661]

371. More importantly, however, the question whether taxation and subsidization can be analyzed as mirror images does not actually matter for the question before the Panel. The real problem with the EC's analysis is that even if one were to assume taxation and subsidization are comparable, the EC's analysis has been far from sufficient to establish any level of pass through.

372. The EC's own expert agrees that the outcome of a pass-through analysis depends on a range of factors. However, the EC has actually determined none of these factors with respect to Boeing's Washington State suppliers. They cannot simply be assumed based on economic models relating to different industries or simply invented because they will "simplify" the analysis. Drs, Dorman and Terris in their reports have explained that depending on the full range of variables that go into a pass-through analysis, pass through may be anywhere between zero and over 100 percent. Indeed, the EC expert himself has acknowledged, and has certainly not disputed that pass through may be less than 100 percent. By accepting economic concepts that – by definition – include the possibility of a zero percent pass-through outcome, he has effectively acknowledged that it may be zero. Because of that, a completely theoretical model, such as that of Prof. Asker, does not provide evidence of the level of pass through sufficient to meet the EC's burden of proof. Thus, the Panel need not address the comparability of subsidy and taxation outcomes for purposes of this dispute.

> *(b) Since under such a market structure pass-through is positive (i.e. non-zero), but its size is principally dependent on the shape of the demand curve, please provide evidence on the nature of demand faced by the (monopolist) suppliers in question in order to narrow down the range of pass-through or to make a reasonable estimate. It would be useful for the parties to provide studies on how the extent of pass-through has been estimated in similar cases.*

373. In its response to this question, the United States explained that the level of pass through in any given situation will depend on a range of factors, including the nature and elasticity of demand, the supply curve, the economic equilibrium chosen, cost structure (constant marginal costs, etc.), industry structure, and product differentiation.[662] Although a monopoly supplier assumption may simplify the analysis to some extent, such a model suffers from flaws similar to those identified with respect to the EC's own Asker model including the fact that it does not deal with the range of variables that will determine whether and to what extent pass through may actually occur.[663]

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[661] Dorman-Terris Report (Exhibit US-1363).

[662] US Response to RPQ 393, para. 322 and Dorman-Terris Report cited there (Exhibit US-1363).

[663] *See, generally,* Dorman-Terris (Exhibit US-1363).

374. Apart from certain procedural questions as to the appropriateness of the Panel's reference to an economic analysis that neither of the parties has advanced and a text that neither of them has cited,[664] the use of a "monopoly supplier" model would not actually solve the pass-through issue and does not offer a shortcut to a "conservative estimate".

375. First, like Prof. Asker's "monopsony" model, the "monopoly supplier" model suggested in Question 393 is purely theoretical and does not fit the facts of the industry, which is more likely characterized by differentiated oligopolies.[665]

376. Second, as Dr. Dorman and Dr. Terris explain in their report, if one were to assume *arguendo* that a "monopoly supplier" model were appropriate, it would indeed be critical to determine the shape of the demand curve. That demand curve, however, may be different for different aerospace supplier markets. As many of these markets are bidding markets – as the EC itself points out – there may not actually be a demand curve.[666] Moreover, even if one were somehow able to determine the shape of the demand curve, the pass-through effect of a per-unit subsidy in such a "monopoly supplier" model depends on a range of other factors as well, including the shape of the supply curve, economies of scale, learning curve effects, resource constraints, and marginal cost curves. All of these, explain Dr. Dorman and Dr. Terris, can be present in aerospace component markets.[667]

377. *Third*, a monopoly supplier model would not actually solve the pass-through question as Boeing, Airbus, and possible other customers would all benefit from any pass through. After all, if the supplier were a true monopolist, all large civil aircraft producers, and possibly others, would have to use its products. One would have to establish how much of the subsidy would pass through to each. Alternatively, if Boeing and Airbus were able to use different suppliers, then such suppliers are not actually monopolists and the monopoly supplier model no longer applies.

378. *Finally*, under a "monopoly supplier" assumption, pass through can still range from 0 percent to more than 100 percent. Dr. Dorman and Dr. Terris gave the example of a monopoly supplier operating in a market with inelastic demand. Such a supplier will have no incentive to pass through any of the subsidy it receives as it would gain no additional sales by passing it through.[668]

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[664] US RPQ 393, para. 317.

[665] Dorman-Terris Report, p. 7 (Exhibit US-1363).

[666] Dorman-Terris Report, footnote 11 (Exhibit US-1363).

[667] Dorman-Terris Report, p. 6.

[668] Dorman-Terris Report, p. 7 (Exhibit US-1363). *See also* U.S. Comment on EC RPQ 384.

379. Citing a declaration of the head of Airbus's Procurement Department, the EC and its expert agree that a "monopoly supplier" model would be "extremely unusual."[669] Despite this, Prof. Asker states that "{his} recommendation in this matter would be to examine the results of {the} literature {on tax incidence in certain specific industries}, paying special attention to those industries that come close to monopoly structure."[670] Having made this recommendation to examine literature that he concedes is not appropriate, Prof. Asker does not do so. He simply refers to studies of tax incidence in the beer and new car markets. Neither of these is actually a monopoly supplier markets,[671] and they likely differ in important ways from markets for aircraft supplies. Nonetheless, Prof. Asker asks the Panel to assume, without any evidentiary basis, that they are somehow relevant for the aerospace supplier markets at issue in this dispute.[672]

380. In this context, we note that the EC expert makes much of the fact that he believes the United States should have provided him with the evidence he needed to perform a basic pass-through analysis.[673] There is no basis for the EC's and its expert's suggestion that the U.S. government somehow would have had exclusive access to the relevant empirical data. The required market and competitive data needed to perform a detailed empirical study would have been as easily available to the EC, through Airbus or through its own independent market research, as they would have been to the United States. The EC's own large civil aircraft manufacturer, Airbus, operates in the same supplier markets, and sources from numerous Washington State suppliers that also supply Boeing. The EC cannot blame the United States for the fact that it chose to rely on theoretical models that, by its own admission and that of its expert, do not actually resolve the pass-through question, and decided not to perform a more detailed empirical analysis.

394. Do the parties agree that in the absence of availability of suitable data, the range of pass-through might nonetheless be narrowed down on the basis of theoretical considerations (e.g. pass-through by a monopolist under profit-maximizing behaviour being shown to be 50 percent independently of the level of marginal cost). Could these or similar deliberations lead to a "conservative" estimate of actual pass-through, absent better information?

381. In its response to Question 394, the United States explained that it is not possible to narrow down, in any reasonable way, the range of possible "pass-through" scenarios on the basis

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[669] EC RPQ 393, para. 547; Asker II, p. 18 (Exhibit EC-1438).

[670] Asker II, p. 20 (Exhibit EC-1437).

[671] Asker II, p. 20 (Exhibit EC-1437).

[672] It is also telling that Prof. Asker decides to refer to studies of the beer industry and certain consumer product industries that found greater than 100 percent pass-through in the body of his text, while relegating a reference to cigarette industry studies that are at odds with his assumption of greater than 100 percent pass through to a footnote. Asker II, p. 20, footnote 19 (Exhibit EC-1437).

[673] Asker II, pp. 18, 19 (Exhibit EC-1437).

of theoretical considerations alone.[674] While debate may be possible as to the precise level of factual evidence required to determine which assumptions are justified and which are not and, consequently, which economic models would most appropriately apply, a purely theoretical answer to the pass-through question – as the EC appears to advocate – is simply not possible.

382. Prof. Asker appears to disagree. He argues that a "conservative" estimate would be 100 percent or more – an unexplained increase from the estimate of only 100 percent in his previous paper. Prof. Asker seems to base this on four arguments.

383. First, Prof. Asker states that

> in view of the fact that Boeing and its suppliers (through the US Government) have not yet provided data on the supply of and demand for Boeing's input, it is unfortunately not possible to provide an estimate beyond that which I have previously provided – i.e., that pass through of the ad valorem subsidies is likely somewhat greater than 100%.[675]

We have already discussed above Prof. Asker's argument that the United States would have had to provide him with data necessary to perform his pass-through analysis, rather than his own client, the EC, or its large civil aircraft producer, Airbus. The United States would also note that neither the SCM Agreement nor the DSU provide for the kind of "punitive" adverse inferences that the EC's expert seems to suggest in this situation.

384. Second, Prof. Asker's standard of proof seems to be that as long as some theoretical models suggest pass through of 100 percent or more then such a level of pass through should be assumed, irrespective of whether the facts actually support this. Thus, says Prof. Asker, "{g}iven that the theoretical models do not rule out greater than 100% pass-through and that commonly used demand specifications accommodate this degree of pass-through (e.g., constant elasticity demand curves), theory gives no reason to adjust the prior conclusion of greater than 100% pass-through in these markets." Elsewhere, his argument is that "{r}elatively few {studies} find pass-through of less than 100%. This leads me to conclude that the majority of evidence favors full (100%) or greater pass-through", and that "evidence suggests that pass-through of greater than 100% is as common, if not more common, that {sic} pass-through of less than 100%."[676] Clearly, however, pointing to theoretical models with no direct relation to the facts at issue or to a "majority of evidence" based on studies of unrelated industries, is not

[674] Although theory-based estimates may be able to fill in certain limited analytical gaps, a reliable estimate requires at least some basis in reality. As Dr. Dorman and Dr. Terris explain, at least certain key characteristics of the aerospace supplier markets at issue (structure, supply curve, demand curve and elasticity, etc.) would have to be established with some level of precision for a reasonable estimate to be possible.

[675] Asker II, p. 20 (Exhibit EC-1437).

[676] Asker II, p. 20 (Exhibit EC-1437).

sufficient for the EC to have met its pass-through burden. In any event, 100 percent pass through does not constitute a "conservative estimate" by any definition of that term.

385. Third, Prof. Asker continues to rely on his claim that "if competitive bidding is an integral part of the Boeing procurement process, then the shape of the demand curve becomes less important in determining the extent of pass through, and the degree of pass through cannot fall below 100%."[677] As explained above, neither the facts, nor economic theory actually support this argument.[678]

386. Finally, Prof. Asker continues to argue that his original hypothesis "sits comfortably" with other models of pass through and the general economic literature on the issue. As discussed in the U.S. comment on the EC response to Question 384, and for all the reasons mentioned there, this is not actually the case.

387. In sum, it is unclear how Prof. Asker's 100 percent pass-through estimate is "conservative" even by his own logic. As the U.S. comments on Questions 384, 385 and 393 explain, Prof. Asker actually acknowledges that situations exist where pass through is less than 100 percent. Indeed, he accepts that this is "common", though in his view not "as common" as pass through of 100 percent or greater.[679] He acknowledges that theoretical models do not adequately allow inferences as to the actual level of pass through in any given situation and that he is not aware of any pre-existing empirical studies of the aerospace supply markets at issue in this dispute. And, finally, he does not contradict examples that the United States has given of situations where pass through might be substantially below 100 percent or even zero.

388. Despite this, Prof. Asker and the EC continue to argue that "{g}iven that the theoretical models – {which they themselves acknowledge do not apply} – "do not rule out greater than 100% pass-through and that commonly used demand specifications accommodate this degree of pass-through (e.g., constant elasticity demand curves), theory gives no reason to adjust the prior conclusion of greater than 100% pass-through in these markets."[680] But the fact that theoretical models "do not rule out" that a particular subsidy might cause adverse effects, or that a particular financial contribution "might" result in a benefit, is not enough for a finding of adverse effects, or a finding of actionable subsidy. By the same token, the fact that theoretical models, which might or might not apply to the actual circumstances at hand, conclude that a certain level of pass through "might" exist, does not allow for a "conservative estimate" of such pass through, or a finding to that effect.

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[677] Asker II, p. 21 (Exhibit EC-1437).

[678] The U.S. Comments on the EC Responses to Questions 384 and 385 address this point in greater detail.

[679] Asker II, p. 21 (Exhibit EC-1437).

[680] Asker II, p. 21(Exhibit EC-1437).