UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, DC

100- TO 150-SEAT LARGE CIVIL AIRCRAFT FROM CANADA

Prehearing Report
Investigation Nos. 701-TA-578 and 731-TA-1368 (Final)

PUBLIC VERSION

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PREFACE

As required by section 207.22 of the U.S. International Trade Commission's Rules of Practice and Procedure (19 C.F.R. § 207.22), this prehearing staff report contains information concerning investigation Nos. 701-TA-578 and 731-TA-1368 (Final): 100- to 150- Seat Large Civil Aircrafts from Canada.

The Commission will hold a public hearing in connection with this proceeding beginning at 9:30 a.m. on Monday, December 18, 2017, in the Hearing Room of the U.S. International Trade Commission Building, Washington, DC. Requests to appear at the hearing are due to be filed in writing with the Secretary to the Commission not later than the close of business (5:15 p.m.) on Wednesday, December 13, 2017.[1] All persons desiring to appear at the hearing and make oral presentations should attend a prehearing conference (if deemed necessary) at 9:30 a.m. on December 15, 2017, at the U.S. International Trade Commission Building. Prehearing briefs must be in conformity with section 207.23 of the Commission's rules (19 C.F.R. § 207.23), and should, to the extent possible, refer to the record and include information and arguments which the party believes relevant to the subject matter of the Commission's determinations under sections 705(b) and 735(b) of the Tariff Act of 1930 (19 U.S.C. §§ 1671d(b) and 1673d(b)). Prehearing briefs must be filed on or before December 12, 2017. If prehearing briefs contain business proprietary information, a non-proprietary version is due December 13, 2017. Any person not an interested party may submit a brief written statement of information pertinent to the proceeding within the time specified and in the manner specified for the filing of

[1] Notices of participation must include a list of witnesses and should indicate the amount of time requested for presentations.

prehearing briefs, in conformity with section 207.23 of the Commission's rules (19 C.F.R. § 207.23).

All oral presentations shall be in conformity with section 207.24 of the rules (19 C.F.R. § 207.24) and each party shall limit its presentation to:

(a) a summary of the information and arguments contained in its prehearing brief;

(b) an analysis of the information and arguments contained in the prehearing briefs of other parties; and

(c) information not available at the time its prehearing brief was filed.

Persons other than parties in this proceeding appearing at the hearing shall limit their presentations to brief statements of their positions with respect to the subject matter of the proceeding. A party may provide written testimony as provided in section 207.24(b) of the Commission's rules (19 C.F.R. § 207.24(b)).

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Note.—Information that would reveal confidential operations of individual concerns may not be published and therefore has been deleted. Such deletions are indicated by astrisks.

PART I: INTRODUCTION

BACKGROUND

These investigations result from petitions filed with the U.S. Department of Commerce ("Commerce") and the U.S. International Trade Commission ("USITC" or "Commission") by The Boeing Company ("Boeing"), Chicago, Illinois, on April 27, 2017, alleging that an industry in the United States is threatened with material injury by reason of subsidized and less-than-fair-value ("LTFV") imports of 100- to 150-seat large civil aircraft ("100- to 150-seat LCA")[1] from Canada. The following tabulation provides information relating to the background of these investigations.[2] [3]

Effective date	Action
April 27, 2017	Petitions filed with Commerce and the Commission; institution of Commission investigations (82 FR 20634, May 3, 2017)
May 17, 2017	Commerce's notices of initiation of countervailing duty investigation (82 FR 24292, May 26, 2017) and antidumping duty investigation (82 FR 24296, May 26, 2017)
June 15, 2017	Commission's preliminary determination (82 FR 27524)
October 2, 2017	Commerce's preliminary countervailing duty determination (82 FR 45807)
October 13, 2017	Commerce's preliminary antidumping duty determination (82 FR 47697)
October 13, 2017	Scheduling of final phase of Commission investigation (82 FR 49850, October 27, 2017)
December 18, 2017	Scheduled date for Commerce's final determinations
December 18, 2017	Scheduled date for the Commission's hearing
January 25, 2018	Scheduled date for the Commission's vote
February 9, 2017	Scheduled date for Commission's views

[1] See the section entitled "The Subject Merchandise" in *Part I* of this report for a complete description of the merchandise subject in this proceeding.

[2] Pertinent *Federal Register* notices are referenced in app. A, and may be found at the Commission's website (www.usitc.gov).

[3] A list of witnesses appearing at the Commission's hearing will be presented in app. B of the staff report.

STATUTORY CRITERIA AND ORGANIZATION OF THE REPORT

Statutory criteria

Section 771(7)(B) of the Tariff Act of 1930 (the "Act") (19 U.S.C. § 1677(7)(B)) provides that in making its determinations of injury to an industry in the United States, the Commission--

> *shall consider (I) the volume of imports of the subject merchandise, (II) the effect of imports of that merchandise on prices in the United States for domestic like products, and (III) the impact of imports of such merchandise on domestic producers of domestic like products, but only in the context of production operations within the United States; and. . . may consider such other economic factors as are relevant to the determination regarding whether there is material injury by reason of imports.*

Section 771(7)(C) of the Act (19 U.S.C. § 1677(7)(C)) further provides that--[4]

> *In evaluating the volume of imports of merchandise, the Commission shall consider whether the volume of imports of the merchandise, or any increase in that volume, either in absolute terms or relative to production or consumption in the United States is significant.. . .In evaluating the effect of imports of such merchandise on prices, the Commission shall consider whether. . .(I) there has been significant price underselling by the imported merchandise as compared with the price of domestic like products of the United States, and (II) the effect of imports of such merchandise otherwise depresses prices to a significant degree or prevents price increases, which otherwise would have occurred, to a significant degree.. . . In examining the impact required to be considered under subparagraph (B)(i)(III), the Commission shall evaluate (within the context of the business cycle and conditions of competition that are distinctive to the affected industry) all relevant economic factors which have a bearing on the state of the industry in the United States, including, but not limited to. . . (I) actual and potential decline in output, sales, market share, gross profits, operating profits, net profits, ability to service debt, productivity, return on investments, return on assets, and utilization of capacity, (II) factors affecting domestic prices, (III) actual and potential negative effects on cash flow, inventories, employment, wages, growth, ability to raise capital, and investment, (IV) actual and potential negative*

[4] Amended by PL 114-27 (as signed, June 29, 2015), Trade Preferences Extension Act of 2015.

effects on the existing development and production efforts of the domestic industry, including efforts to develop a derivative or more advanced version of the domestic like product, and (V) in {an antidumping investigation}, the magnitude of the margin of dumping.

In addition, Section 771(7)(J) of the Act (19 U.S.C. § 1677(7)(J)) provides that—[5]

(J) EFFECT OF PROFITABILITY.—The Commission may not determine that there is no material injury or threat of material injury to an industry in the United States merely because that industry is profitable or because the performance of that industry has recently improved.

Organization of report

Part I of this report presents information on the subject merchandise, subsidy and dumping margins, and domestic like product. *Part II* of this report presents information on conditions of competition and other relevant economic factors. *Part III* presents information on the condition of the U.S. industry, including data on capacity, production, shipments, inventories, and employment. *Parts IV* and *V* present the volume of subject imports and pricing of domestic and imported products, respectively. *Part VI* presents information on the financial experience of U.S. producers. *Part VII* presents the statutory requirements and information obtained for use in the Commission's consideration of the question of threat of material injury as well as information regarding nonsubject countries.

MARKET SUMMARY

100- to 150-seat LCA are generally used to transport passengers, their baggage, and, at times, other cargo. They are used on short- to medium-range routes, including trans-continental service between the east and west coasts of the United States. These 100- to 150-

[5] Amended by PL 114-27 (as signed, June 29, 2015), Trade Preferences Extension Act of 2015.

seat LCA are able to service routes that are longer and subject to higher passenger traffic levels than those served by regional jets, as well as routes where there is insufficient demand to fill larger single aisle LCA adequately.[6] Boeing is the sole U.S. producer of 100- to 150-seat LCA, while Bombardier Inc. ("Bombardier") is the sole producer of 100- to 150-seat LCA in Canada.[7] While no firm imported 100- to 150-seat LCA from Canada in 2016 (or at any time as of the date of this report), ***.[8] The largest U.S. airlines by overall fleet size (including larger LCA) are American Airlines ("American"), Delta, JetBlue Airways Corporation ("JetBlue"), Southwest Airlines ("Southwest"), and United Airlines ("United"). These airlines account for the bulk of likely demand for 100- to 150-seat LCA in the U.S. market. The largest aircraft leasing/financing companies by overall fleet size are Air Lease Corporation ("Air Lease"); Bank of America Corporation ("BofA Leasing") and GE Capital Aviation Services LLC ("GECAS").

Apparent U.S. consumption of 100- to 150-seat LCA totaled *** ($***) in 2016. Currently, Boeing is the only producer of 100- to 150-seat LCA in the United States. Boeing's U.S. shipments of 100- to 150-seat LCA totaled *** ($***) in 2016, and accounted for all apparent U.S. consumption by quantity

[6] Petition, pp. 35-36. 100- to 150-seat LCA are not used on long-haul routes, such as between Asia and the United States, which are served by twin-aisle LCA. Ibid., p. 36.

[7] Airbus SAS ("Airbus") also produces 100- to 150-seat LCA in facilities located in nonsubject countries Germany and China. Airbus Americas Inc.'s ("Airbus Americas") produces other single aisle LCA in the United States.

[8] *** importer/purchaser questionnaire response, question II-8.

and value. There were no U.S. imports/purchases from subject sources in 2016, nor were there U.S. imports/purchases of 100- to 150-seat LCA from nonsubject sources in 2016.[9]

SUMMARY DATA AND DATA SOURCES

A summary of data collected in the investigations is presented in appendix C.[10] Except as noted, U.S. industry data are based on the questionnaire response of one firm, Boeing, which accounted for all U.S. production of 100- to 150-seat LCA during 2016.[11] [12] U.S. imports and sales for importation are based on questionnaire responses of 13 firms that have purchased, ordered, accepted delivery of, received offers for sale for, and/or entered into a lease arrangement for 100- to 150-seat LCA or certain other single aisle LCA[13] since January 1, 2014.

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[9] In the preliminary phase investigations, Virgin America, Inc. ("Virgin America") reported ***.

[10] Table C-1 includes only 100- to 150-seat LCA; Table C-2 includes 100- to 150-seat LCA and 737-800, MAX 8 and equivalent aircraft; and Table C-3 includes all of the foregoing and 737-900, -MAX 9, -MAX 10 and equivalents.

[11] Airbus Americas' U.S. manufacturing facility in Mobile, Alabama began production in July 2015 and is equipped to build A320 and A321 models. "Airbus Begins Production of First U.S.-Built A320 in Mobile," http://www.airbus.com/company/americas/newsroom/newsroom-single/detail/airbus-begins-production-of-first-us-built-a320-in-mobile/, May 8, 2017. A U.S. producers' questionnaire was received from Airbus Americas ***. Airbus Americas ***. Airbus Americas' U.S. producers' questionnaire response, V-2a and V-2b.

[12] The C Series Aircraft Limited Partnership ("CSALP") submitted a U.S. producers' questionnaire response with data regarding planned production of 100- to 150-seat LCA in the United States. CSALP is definitive investment agreement (signed in October, 2017) between Bombardier and Airbus involving establishment of a C Series assembly line for U.S. customers at the currently-existing Airbus Americas' plant in Mobile, Alabama. Airbus will have a majority (50.01 percent) stake in CSALP. Finalization of the agreement is pending regulatory approval, expected in the second half of 2018. Press Release, *Airbus and Bombardier Announce C Series Partnership*, retrieved November 24, 2017 at http://www.airbus.com/newsroom/press-releases/en/2017/10/airbus-bombardier-cseries-agreement.html (also see, part III under "Production-related activities").

[13] "Other single aisle LCA" include large civil aircraft with a single aisle that do not meet the definition of 100- to 150-seat LCA as defined on page 2 or regional civil aircraft as defined above (e.g., Boeing 737-800/737 MAX 8, 737-900/737 MAX 9, 737 MAX 10, and Airbus A320 and A321).

These U.S. importer/purchasers are believed to have accounted for all imported 100- to 150-seat LCA and other single aisle LCA during 2016. Foreign industry data and related information are based on the questionnaire response of Bombardier, the producer of 100- to 150-seat LCA in Canada.[14]

PREVIOUS AND RELATED INVESTIGATIONS

On May 27, 1982, countervailing duty petitions were filed with Commerce and the Commission on behalf of Commuter Aircraft Corporation of Youngstown, Ohio alleging that certain commuter airplanes imported from France and Italy were being subsidized by the governments of France and Italy. In the preliminary phase of the proceeding, the Commission determined that there was no reasonable indication that an industry in the United States was materially injured or was threatened with material injury, or that the establishment of an industry in the United States was materially retarded by reason of certain commuter airplanes from France and Italy.[15]

On August 13, 1982, a countervailing duty petition was filed with Commerce and the Commission on behalf of Fairchild Swearingen Corporation of San Antonio, Texas alleging that certain commuter airplanes imported from Brazil were being subsidized by the government of Brazil. In the preliminary phase of the proceeding, the Commission again determined that there was no reasonable indication that an industry in the United States was materially injured or was

[14] Although a foreign producer questionnaire was issued to ***.

[15] *Certain Commuter Airplanes from France and Italy: Investigation Nos. 701-TA-174 and 175 (Preliminary)*, USITC Publication 1269, July 1982, pp. 1-2.

threatened with material injury, or that the establishment of an industry in the United States was materially retarded by reason of imports of certain commuter airplanes from Brazil.[16]

The Commission has also conducted three research studies on related aircraft at the request of the United States House of Representatives Committee on Ways and Means. The first study was published in November 1998 concerning the changing structure of the global LCA industry and market and its implication for the competitiveness of the U.S. industry.[17] In June 2001, the Commission published another study concerning the competitive assessment of the U.S. LCA aerostructures industry.[18] The Commission completed its third study in April 2012 concerning structures and factors affecting competitiveness in the business jet aircraft industry.[19]

NATURE AND EXTENT OF SUBSIDIES AND SALES AT LTFV

Subsidies

On October 2, 2017, Commerce published notice in the *Federal Register* of its preliminary determination of countervailing subsidies for producers and exporters of 100- to 150-seat LCA from Canada. Commerce has preliminarily calculated a countervailing duty margin of 219.63 percent for 100- to 150-seat LCA from Canada from Bombardier as well as for all

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[16] *Certain Commuter Airplanes from Brazil: Investigation Nos. 701-TA-188 (Preliminary)*, USITC Publication 1291, September 1982, p. 1.

[17] *The Changing Structure of the Global Large Civil Aircraft Industry and Market: Implications for the Competitiveness of the U.S. Industry: Investigation No. 332-384*, USITC Publication 3143, November 1998.

[18] *Competitive Assessment of the U.S. Large Civil Aircraft Aerostructures Industry: Investigation No. 332-414*, USITC Publication 3433, June 2001.

[19] *Business Jet Aircraft Industry: Structure and Factors Affecting Competitiveness: Investigation No. 332-526*, USITC Publication 4314, April 2012.

other companies.[20] Commerce preliminarily determined the following programs to be countervailable:[21]

1. Equity Infusion by *Investissement Québec* ($1 billion)
2. Launch aid by Canadian Federal Government ($276.5 million)
3. Launch aid by Québec Provincial Government ($92.4 million)
4. Launch aid by U.K. Government
5. Government Provision of Production Facilities and Land at Mirabel for Less Than Adequate Remuneration
6. Tax Incentives and Other Support Provided by the City of Mirabel
7. PR@M Tax Credit
8. Tax Credit from the Government of Quebec for the C Series
9. U.K. R&D Tax Credits
10. Technology Demonstration Program ($42.7 million)
11. *Emploi-Québec*
12. Invest Northern Ireland
13. Innovate UK and ATI Grants

Commerce preliminarily determined that the following programs did not confer a benefit during the period of investigation:[22]

1. Equity Infusion by Caisse de Dépôt et Placement du Québec
2. Other Programs Conferring No Measurable Benefit During the POI

Sales at LTFV

On October 13, 2017, Commerce published notice in the *Federal Register* of its preliminary determination of sales at LTFV with respect to imports of 100- to 150-seat LCA from

[20] *100- to 150-Seat Large Civil Aircraft from Canada: Preliminary Affirmative Countervailing Duty Determination and Alignment of Final Determination With Final Antidumping Duty Determination*, 82 FR 45807, October 2, 2017.

[21] *Enforcement and Compliance Office of AD/CVD Operations, Decision Memorandum for the Affirmative Preliminary Determination in the Countervailing Duty Investigation of 100- to 150-Seat Large Civil Aircraft from Canada*, September, 2017.

[22] Ibid.

Canada. Commerce has preliminarily determined an antidumping duty margin of 79.82 percent for 100- to 150-seat LCA from Canada from Bombardier as well as for all other companies.[23]

THE SUBJECT MERCHANDISE

Commerce's scope

Commerce has defined the scope of these investigations as follows:[24]

> {A}ircraft, regardless of seating configuration, that have a standard 100- to 150-seat two-class seating capacity and a minimum 2,900 nautical mile range, as these terms are defined below.
>
> "Standard 100- to 150-seat two-class seating capacity" refers to the capacity to accommodate 100 to 150 passengers, when eight passenger seats are configured for a 36-inch pitch, and the remaining passenger seats are configured for a 32-inch pitch.
>
> "Pitch" is the distance between a point on one seat and the same point on the seat in front of it.
>
> "Standard 100- to 150-seat two-class seating capacity" does not delineate the number of seats actually in a subject aircraft or the actual seating configuration of a subject aircraft. Thus, the number of seats actually in a subject aircraft may be below 100 or exceed 150.
>
> A "minimum 2,900 nautical mile range" means:
>
> > (i) able to transport between 100 and 150 passengers and their luggage on routes equal to or longer than 2,900 nautical miles; or
> >
> > (ii) covered by a U.S. Federal Aviation Administration ("FAA") type certificate or supplemental type certificate that also covers other aircraft with a minimum 2,900 nautical mile range.

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[23] *100- to 150-Seat Large Civil Aircraft from Canada: Preliminary Affirmative Determination of Sales at Less Than Fair Value*, 82 FR 47697, October 13, 2017.

[24] *Enforcement and Compliance Office of AD/CVD Operations, Decision Memorandum for the Affirmative Preliminary Determination in the Countervailing Duty Investigation of 100- to 150-Seat Large Civil Aircraft from Canada*, September 25, 2017; *Enforcement and Compliance Office of AD/CVD Operations, Decision Memorandum for the Affirmative Preliminary Determination in the Less-Than-Fair-Value Investigation of 100- to 150-Seat Large Civil Aircraft from Canada*, October 4, 2017

The scope includes all aircraft covered by the description above, regardless of whether they enter the United States fully or partially assembled, and regardless of whether, at the time of entry into the United States, they are approved for use by the FAA.

The merchandise covered by this investigation is currently classifiable under Harmonized Tariff Schedule of the United States ("HTSUS") subheading 8802.40.0040. The merchandise may alternatively be classifiable under HTSUS subheading 8802.40.0090. Although these HTSUS subheadings are provided for convenience and customs purposes, the written description of the scope of the investigation is dispositive.

Tariff treatment

Based upon the scope set forth by the Department of Commerce, information available to the Commission indicates that the merchandise subject to these investigations is classified in HTS subheading 8802.40.00 (statistical reporting numbers 8802.40.0040, covering new passenger transport airplanes, or 8802.40.0090, covering such transports if used or rebuilt, all of which are of an unladen weight exceeding 15,000 kg).[25] The Column 1-General rate of duty is "Free."

THE PRODUCT

Description and applications

100- to 150-seat large civil aircraft, for the purposes of this proceeding, are defined as aircraft having a standard two-class seating capacity between 100 and 150 seats and a minimum range of 2,900 nautical miles. Standard seating capacity refers to a typical, two-class arrangement used on commercial airline routes where the first class comprises eight passenger seats with a 36-inch pitch and the second class comprises the remaining seats with a 32-inch

[25] Decisions on the tariff classification and treatment of imported goods are within the authority of U.S. Customs and Border Protection.

pitch.[26] Aircraft with the capacity for 100- to 150-seats as described above, but currently configured in a non-compliant manner are still considered to be within the scope of these investigations.[27] For example, an aircraft designed for a single, business class containing fewer than 100 seats would still be classified as being within the scope if a two-class seating arrangement for this aircraft would accommodate 100 to 150 seats.

Subject aircraft must be capable of transporting 100 to 150 passengers with accompanying luggage on routes greater than or equal to 2,900 nautical miles. Aircraft with ranges below 2,900 nautical miles but still covered by a relevant FAA-type certificate or supplemental certificate are considered to be within the scope of these investigations. This provision allows for the inclusion of aircraft eligible for certifications that have been subsequently modified for sub-2,900 nautical mile ranges but would otherwise be capable of traveling a greater distance.[28]

100- to 150-seat LCA encompass the smallest classification of LCA and are designed primarily for use in commercial passenger transport as opposed to military, private business, or freight purposes.[29] In contrast to commercial aircraft, business jets are primarily designed for fewer passengers and longer distances. For example, the Boeing BBJ MAX 7, the business variant of the Boeing MAX 7, supports eight passengers and has a range of 7,000 nautical miles

[26] Pitch is the distance between a singular point on one seat and the same point on the seat in an adjacent row. *100- to 150-Seat Large Civil Aircraft from Canada: Initiation of Less-Than-Fair-Value Investigation*, 82 FR 24296, May 26, 2017.

[27] Ibid.

[28] Ibid.

[29] There is no official definition for large civil aircraft that incorporates a seating requirement. The Commission has previously followed the traditional definition of large civil aircraft of having more than 100 seats and weighing over 33,000 pounds. *Competitive Assessment of the U.S. Large Civil Aircraft Aerostructures Industry: Investigation No. 332-414*, USITC Publication 3433, June 2001.

because of the addition of auxiliary fuel tanks.[30] In comparison, the Boeing MAX 7 is designed for a two-class seating capacity of 138 passengers and a maximum range of 3,850 nautical miles.[31] The subject aircraft are used by airlines on routes dependent on higher passenger demand than smaller, regional jets would be capable of serving as well as routes where there is insufficient demand for higher-capacity civil aircraft.[32] Given a minimum 2,900 nautical mile range, 100- to 150-seat LCA are suited for short- and medium-ranged routes including transcontinental U.S. travel. Transoceanic routes are greater in distance and are instead serviced by larger, two-aisled civil aircraft.[33] The 737 Next Generation and 737 MAX families of aircraft are the only single aisle LCA that Boeing currently produces. The current 737 Next Generation aircraft include the 737-700, 737-800, and 737-900. The current 737 MAX aircraft include the 737 MAX 7, 737 MAX 8, 737 MAX 9, and 737 MAX 10. The other LCA that Boeing produces, the 747, 767, 777, and 787 families of aircraft, all have dual aisles.[34]

Airlines are the primary purchasers of 100- to 150-seat LCA and negotiate binding contracts with producers, which specify contract details including model types, quantity of aircraft, prices, delivery dates, and payment terms regarding future deliveries of the aircraft.[35] Purchasing decisions usually occur after a lengthy sales campaign and multiple competing bids

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[30] Boeing, "Introducing the BBJ MAX 7, BBJ MAX 7 Specs," http://www.boeing.com/commercial/bbj/#/aircraft/bbj-737max/characteristics/bbj-max-7/ (accessed on November 20, 2017)

[31] Petition, p. 36.

[32] *100- to 150-Seat Large Civil Aircraft from Canada: Initiation of Less-Than-Fair-Value Investigation*, 82 FR 24296, May 26, 2017.

[33] Petition, p. 36.

[34] Boeing, "777 Design Highlights," http://www.boeing.com/commercial/777/#/design-highlights/unmatched-capabilities/family-flexibility/capacity/.

[35] Petition, p. 47.

from several producers.[36] These arrangements typically stipulate an initial payment and periodic pre-delivery payments that ensure a revenue stream to producers while they are manufacturing the aircraft. Upon delivery of the aircraft, a final payment is made and the aircraft is then transferred to the purchaser.[37] Frequently, the time between an order and delivery of domestically produced, 100- to 150-seat LCA is ***.[38]

As defined, there are two domestically produced aircraft meeting the definition of 100- to 150-seat LCA: the Boeing 737-700 and the 737 MAX 7.[39] The Boeing 737-700 is capable of transporting 126 passengers in a typical two-class seating arrangement at a maximum range of 3,365 nautical miles. The Boeing 737 MAX 7 is capable of transporting 138 passengers in a typical, two-class seating arrangement a maximum range of 3,850 nautical miles.[40] The additional range of the Boeing 737 MAX 7 is possible due to its use of the larger Leap-1B engine, as opposed to the CFM56-7 engine normally used by the Boeing 737-700.[41] Other variants of the Boeing 737-700 include the Boeing 737-700C and the Boeing 737-700W. The Boeing 737-700C is a derivative of the Boeing 737-700, which is capable of converting between an all-

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[36] Ibid., p. 49.
[37] Ibid., p. 48.
[38] Boeing's postconference brief, p. 19.
[39] The Boeing 737 MAX 7 is the planned successor to the Boeing 737-700 and is expected to enter into service in 2019. Petition, p. 26. A previously manufactured aircraft, the Boeing 717 model, was capable of transporting 106 passengers in a typical, two-class seating arrangement at a range of 2,055 nautical miles. Boeing produced 156 Boeing 717 units between 1998 and 2006 after which production was ceased. Boeing, "The 717 is a Full-Size Airplane for the Regional Market," Boeing Presentation, 2005, http://www.boeing.com/resources/boeingdotcom/company/about_bca/startup/pdf/historical/717_passenger.pdf; Boeing, "Historical Snapshot," http://www.boeing.com/history/products/717-md-95.page.
[40] Petition, p. 36.
[41] Boeing, "LEAP-1B: 737 MAX vs Next-Generation 737," http://www.boeing.com/commercial/737max/by-design/#/leap-1b-737ng-737max.

passenger setup and an all-cargo setup. The Boeing 737-700C has reinforced wings as well as a main cargo door on the fuselage.[42] The Boeing 737-700W is the typical Boeing 737-700 design with added winglets. Winglets are carbon-fiber composite extensions which are retrofitted onto the wings of a Boeing 737-700 to increase fuel efficiency.[43]

In addition to the 737-700 and 737 MAX 7, Boeing currently offers larger 737 models including the 737-800, 737-900, MAX 8, MAX 9, and MAX 10. Every Boeing 737 model is single aisle and meets the range requirement; however, only the 737-700 and MAX 7 meet the seating capacity requirement specified by Commerce's scope. The Boeing 737-800 and 737-900 are the larger 737 next-generation models currently produced and have 162 and 178 two-class seating capacities respectively.[44] The Boeing 737 MAX 8, 737 MAX 9, and 737 MAX 10 are designed to replace their corresponding next-generation models and have two-class seating capacities of 178, 193, and 204, respectively.[45]

Globally, there are six aircraft models that meet the definition of 100- to 150-seat LCA for this proceeding. The Boeing 737-700 and 737 MAX 7 models are produced in the United States, the Bombardier CS100 and CS300 models are produced in Canada, and the Airbus

[42] Boeing, "FAA Certifies Boeing Next-Generation 737-700 Convertible," Boeing News Release, http://boeing.mediaroom.com/2000-09-07-FAA-Certifies-Boeing-Next-Generation-737-700-Convertible.

[43] Boeing, "Blended Winglets Improve Performance," Aero, Qtr 3, 2009, http://www.boeing.com/commercial/aeromagazine/articles/qtr_03_09/article_03_1.html.

[44] Boeing, "Boeing Next-Generation 737 Technical Specs," http://www.boeing.com/commercial/737ng/#/technical-specs (accessed on November 20, 2017)

[45] Boeing, "Introducing the 737 MAX 10 Technical Specs," http://www.boeing.com/commercial/737max/#/features (accessed on November 20, 2017)

A319ceo and A319neo models are produced in the European Union and China.[46] Table I-1 compares the physical similarities between the six aircraft models.

Table I-1
100- to 150-seat LCA: Physical characteristics of 100- to 150-seat LCA

Model	Passengers (two-class)	Wingspan (m)	Length (m)	Height (m)
Boeing 737-700	126	35.8	33.6	12.5
Boeing 737 MAX 7	138	35.9	35.6	12.3
Bombardier CS100	108	35.1	35.0	11.5
Bombardier CS300	130	35.1	38.7	11.5
Airbus A319ceo	124	35.8	33.8	11.8
Airbus A319neo	140	35.8	33.8	11.8

Source: Boeing, "Next-Generation 737 Design Highlights: 737-700," http://www.boeing.com/commercial/737ng/#/design-highlights/characteristics/737-700/; Boeing, "737 Max 7 Characteristics," http://www.boeing.com/commercial/737max/by-design/#/737max-7-characteristics; Bombardier, "C Series: CS100," http://commercialaircraft.bombardier.com/content/dam/Websites/bca/literature/cseries/C%20Series_CS100_Factsheet201607_EN.pdf; Bombardier, "C Series: CS300," http://commercialaircraft.bombardier.com/content/dam/Websites/bca/literature/cseries/C%20Series_CS300_Factsheet_201607_EN.pdf; Airbus, "Airbus Family Figures," March 2016 Edition, http://www.airbus.com/fileadmin/media_gallery/files/brochures_publications/aircraft_families/Airbus-Family-figures-booklet-March2016.pdf.

Manufacturing processes

Domestic production of 100- to 150-seat LCA occurs primarily at Boeing's production facility in Renton, Washington, where wing manufacturing, final assembly, and pre-flight preparation of the Boeing 737-700 occur. When the Boeing 737 MAX 7 fully enters production, it will also occur at Boeing's Renton facility and follow a similar production process to that of the Boeing 737-700, using much of the same equipment.[47] Boeing began producing the first 737

[46] Petition, p. 32. The term "neo" stands for new engine option, and the term "ceo" stands for current engine option. Petition, p. 30.

[47] Petition, p. 41.

Max 7 wing spar in its Renton facility in October 2017.[48] The Renton facility operates *** production lines, *** of which are capable of producing *** aircraft per month while *** is capable of producing *** aircraft per month. Boeing anticipates that the Boeing MAX 7 will be initially produced ***.[49] The fuselages of the aircraft are produced in Wichita, Kansas by Spirit Aerosystems before being shipped to the Renton facility for assembly.[50] Additional fabrication and production facilities involved with the manufacturing processes of the Boeing 737-700 and Boeing 737 MAX 7 are located in Ladson, South Carolina; Auburn, Washington; Salt Lake City, Utah; Gresham, Washington; Helena, Montana; Everett, Washington; Puyallup, Washington; and Tukwila, Washington. Approximately *** percent of Boeing 737-700 and MAX 7 airframes are sourced from within the United States.[51]

Airbus operates a final aircraft assembly facility in Mobile, Alabama which produces the A320 family of aircraft. Aircraft components are produced in other Airbus facilities around the world before being shipped to Mobile to undergo final assembly.[52] The facility began producing the larger, A321 model in 2015 and delivered its first A320 in 2017.[53] Based on projected

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[48] A wing spar is the main structural component of the wing. Merida, Elizabeth. "Production on 737 MAX 7, the Newest MAX Airplane, Gets Underway," Boeing, October 5, 2017. http://www.boeing.com/company/about-bca/washington/737-max7-production-10-05-17.page.

[49] Commission plant tour with Boeing, November 2-3, Renton Washington.

[50] Conference transcript, p. 60 (Conner).

[51] Commission plant tour with Boeing, November 2-3, Renton Washington.

[52] Vertical stabilizers originate in Spain, wings originate in Wales, the front fuselage originates in France, and the back fuselage originates in Germany. Appelbaum, Binyamin and Christopher Payne, "A Look Insude Airbus's Epic Assembly Line," New York Times, May 3, 2017. https://www.nytimes.com/2017/05/03/magazine/a-look-inside-airbuss-epic-assembly-line.html

[53] Tucker, Kristi. "Airbus Delivers First U.S. Produced A320 to Spirit Airlines," Airbus, August 28, 2017. http://www.airbus.com/newsroom/press-releases/en/2017/08/airbus-delivers-first-u-s--produced-a320-to-spirit-airlines.html

delivery data, the facility will begin producing A319 aircraft in 2019.[54] However, according to Airbus CEO Tom Enders, Airbus will prioritize the Bombardier C series over the A319 if the deal for Airbus to receive 50.01 percent of CSALP is completed. Also upon completion of the deal, Airbus is planning on expanding production in its Mobile facility to include C Series aircraft – which could delay any A319 production plans at the facility.[55]

Aircraft manufacturing is a complex process involving many parts, suppliers, and facilities. Production rates, including supply chain requirements, are typically planned two or more years in advance due to the complicated nature of producing aircraft.[56] In addition to the length of time required in producing aircraft, the expense involved with design and development, as well as the capital intensive nature of the production equipment, highlight the high costs associated with aircraft manufacturing.[57] While economies of scale can be achieved through producing multiple aircraft models at the same facility with the same employees, there are still unique production tools required in the assembly of each individual model variant, which further adds to the cost and complexity of production.[58] Additionally, ***.[59]

[54] Petition, p. 45.
[55] Katz, Benjamin. "Airbus Pledges to Put C Series Ahead of A319 in Sales Push," Bloomberg, October 18, 2017. https://www.bloomberg.com/news/articles/2017-10-18/airbus-pledges-to-put-c-series-ahead-of-own-a319-in-sales-push
[56] Conference transcript, p. 28 (Conner).
[57] Ibid., p. 36 (Nickelsburg).
[58] Ibid., p. 45, 62 (Anderson, Conner); Boeing's postconference brief, p. 13.
[59] Commission plant tour with Boeing, November 2-3, Renton Washington.

Boeing ***. 100- to 150-seat LCA are produced ***.[60] Switching between aircraft models during manufacturing, even within the same family of aircraft, may disrupt and cause inefficiencies within the production system.[61] Manufacturing differences between different LCA models produced on the shared production lines include modifications to the fuselage, wiring lengths, and landing gear requirements, which have ramifications throughout the entire supply chain.[62]

All modern aircraft, including 100- to 150-seat LCA, consist of four main components: an airframe, engines, electronic and mechanical systems, and the interior.[63] First, an airframe encompasses the physical structure of an aircraft and includes the fuselage (main body of the aircraft), the wings, and the tail (the aft-most section of the aircraft, including all fins and stabilizers). Aluminum, aluminum alloys, and carbon fiber reinforced plastic composite are the main materials used in the construction of airframes.[64] Second, 100- to 150-seat aircraft use two turbofan engines to power the taxiing, take-off, and flight of the aircraft. All six 100- to 150-seat aircraft models in this proceeding have one engine installed beneath each of the wings.[65] Third, aircraft systems include all electronic and mechanical systems used for "fight controls; communications; navigation; weather; collision-avoidance; aircraft health monitoring; fuel; in-

[60] Commission plant tour with Boeing, November 2-3, Renton Washington.
[61] Conference transcript, p. 61 (Conner).
[62] Ibid., p. 62 (Conner).
[63] Petition, p. 35.
[64] Ibid.
[65] Ibid.

flight entertainment; and the environmental control system that regulates cabin air supply, temperature, and pressurization."[66] Lastly, an aircraft's interior includes all surface structures, seating, restrooms, and other passenger and crew accommodations. The interior of an aircraft also includes all storage and cargo hold areas.[67]

DOMESTIC LIKE PRODUCT ISSUES

In the preliminary phase of these investigations, the petitioner proposed that the Commission define the domestic like product as all domestically produced 100- to 150-seat LCA, currently produced or marketed, that satisfy the criteria in the scope description.[68] Respondents countered that the "domestic like product should be the 737 family of aircraft, which represent a continuum of sizes, ranges, operating costs, and other features," claiming that "there is no clear dividing line at 150 seats or elsewhere."[69] They also argued that the Commission should define the domestic like product as all single aisle LCA with the ability to hold at least 100 seats.[70]

In the final phase of these investigations, staff collected data from U.S. producers and importer/purchasers regarding the comparability of Boeing's 100- to 150-seat LCA to other

[66] Ibid.

[67] Ibid.

[68] Ibid., p. 36. According to Boeing, only two such aircraft models currently exist in the United States, which are the Boeing 737-700 and its successor, the 737 MAX 7, which Boeing actively markets and is scheduled to enter into service in 2019. These models are designed to accommodate 126 to 138 passengers, respectively, in a standard two-class cabin configuration. Carrying full passenger loads, the maximum ranges for each model are 3,365 and 3,850 nautical miles, respectively. Boeing contends that there are clear dividing lines between 100- to 150-seat LCA from other single aisle LCA. Ibid; conference transcript, p. 47 (Anderson); Boeing's postconference brief, p. 5.

[69] Conference transcript, p. 15 (Lichtenbaum); Delta's postconference brief, pp. 8-9, 14; Bombardier's postconference brief, p. 3.

[70] Conference transcript, p. 184 (Aranoff); Bombardier's postconference brief, p. 4.

single aisle LCA (e.g., other Boeing 737 models). Airbus Americas reported that it *** with the Boeing 737 model aircraft; however, its parent company, Airbus, which plans to have a controlling stake in CSALP, did respond to the Commission's to the U.S. producers' questionnaire regarding comparability of these aircraft based on CSALP's anticipated U.S. operations. [71]

The Commission's decision regarding the appropriate domestic product(s) that are "like" the subject imported product is based on a number of factors including: (1) physical characteristics and uses; (2) interchangeability; (3) common manufacturing facilities, production processes, and production employees; (4) channels of distribution; (5) customer and producer perceptions; and (6) price. Information regarding these factors is discussed below.

Table I-2 presents a summary of Boeing, CSALP, and U.S. importer/purchasers' comparisons of 100- to 150-seat LCA (i.e., Boeing's 737-MAX 7 or 737-700) to Boeing's other 737 models (all of which fall under the "other single aisle LCA" category), by factor. The majority of U.S. importer/purchasers indicated that manufacturing facilities, channels of distribution, and market perceptions of 100- to 150-seat LCA were fully comparable to all other single aisle LCA. U.S. importer/purchasers were nearly unanimous in viewing physical characteristics and interchangeability of 100- to 150-seat LCA as mostly or somewhat comparable to other single aisle LCA. Boeing reported that channels of distribution are *** comparable; interchangeability and physical characteristics are *** comparable; and

[71] Narrative descriptions from Boeing, CSALP, and U.S. importer/purchasers concerning the six factors considered for the domestic like product analysis are presented in app. D.

price and customer and producer perceptions are *** comparable with respect to comparisons of 100- to 150-seat LCA to all other single aisle LCA.

Table I-2

100- to 150-seat LCA: Ratings of the comparability of 100- to 150-seat LCA to all other single aisle LCA by Boeing, U.S. importer/purchasers, and CSALP

Product pair / factor	U.S. producer Boeing				U.S. importer / purchasers				CSALP (Bombardier)			
	Fully	Mostly	Somewhat	Not at all	Fully	Mostly	Somewhat	Not at all	Fully	Mostly	Somewhat	Not at all
	Number of firms (count)				Number of firms (count)				Number of firms (count)			
100- to 150-seat LCA vs. 737-800 / Max 8.-- Physical characteristics and uses	***	***	***	***	---	4	5	---	***	***	***	***
Interchangeability	***	***	***	***	---	2	7	---	***	***	***	***
Manufacturing facilities, processes, and employees	***	***	***	***	6	1	---	---	***	***	***	***
Channels of distribution	***	***	***	***	8	1	---	---	***	***	***	***
Customer and producer perceptions	***	***	***	***	4	1	2	1	***	***	***	***
Price	***	***	***	***	---	---	4	5	***	***	***	***
100- to 150-seat LCA vs. 737-900 / Max 9.-- Physical characteristics and uses	***	***	***	***	---	3	5	1	***	***	***	***
Interchangeability	***	***	***	***	---	1	8	---	***	***	***	***
Manufacturing facilities, processes, and employees	***	***	***	***	6	1	---	---	***	***	***	***
Channels of distribution	***	***	***	***	8	1	---	---	***	***	***	***
Customer and producer perceptions	***	***	***	***	3	1	3	1	***	***	***	***
Price	***	***	***	***	---	---	4	5	***	***	***	***
100- to 150-seat LCA vs. Max 10.-- Physical characteristics and uses	***	***	***	***	---	3	3	1	***	***	***	***
Interchangeability	***	***	***	***	---	1	5	1	***	***	***	***
Manufacturing facilities, processes, and employees	***	***	***	***	6	1	---	---	***	***	***	***
Channels of distribution	***	***	***	***	8	1	---	---	***	***	***	***
Customer and producer perceptions	***	***	***	***	3	1	2	2	***	***	***	***
Price	***	***	***	***	---	---	2	5	***	***	***	***

Note.-- CSLAP, the proposed joint venture between Bombardier and Airbus, completed a U.S. producers' questionnaire based on its plans to assemble 100- to 150-seat LCA at Airbus Americas' facility in Alabama, but has yet to begin operations.

Source: Compiled from data submitted in response to Commission questionnaires.

Table I-3 presents a summary of Boeing, CASLP, and U.S. importer/purchasers' comparisons among Boeing's other single aisle LCA (i.e., 737-MAX 8, -MAX 9, and -MAX 10 or previous generation equivalents).

The majority of U.S. importer/purchasers reported that manufacturing facilities, channels of distribution, and market perceptions of were fully comparable among other single aisle LCA. U.S. importer/purchasers were nearly unanimous in viewing physical characteristics and interchangeability of other single aisle LCA as mostly or somewhat comparable to the other single aisle LCA. Price was the only category in which most U.S. importer/purchasers found the other single aisle LCA to be not at all comparable to each other. Boeing reported that, while channels of distribution are *** comparable, customer and producer and prices are *** comparable among the other single aisle LCA.

Table I-3

100- to 150-seat LCA: Ratings of the comparability of other single aisle LCA to other single aisle LCA by Boeing, U.S. importer/purchasers, and CSALP

	U.S. producer Boeing				U.S. importer / purchasers				CSALP (Bombardier)			
Product pair / factor	Fully	Mostly	Somewhat	Not at all	Fully	Mostly	Somewhat	Not at all	Fully	Mostly	Somewhat	Not at all
	Number of firms (count)				Number of firms (count)				Number of firms (count)			
737-800 / Max 8 vs. 737-900 / Max 9.-- Physical characteristics and uses	***	***	***	***	---	3	6	---	***	***	***	***
Interchangeability	***	***	***	***	---	2	7	---	***	***	***	***
Manufacturing facilities, processes, and employees	***	***	***	***	6	1	---	---	***	***	***	***
Channels of distribution	***	***	***	***	8	1	---	---	***	***	***	***
Customer and producer perceptions	***	***	***	***	3	1	3	1	***	***	***	***
Price	***	***	***	***	---	---	4	5	***	***	***	***
737-800 / Max 8 vs. Max 10.-- Physical characteristics and uses	***	***	***	***	---	3	3	1	***	***	***	***
Interchangeability	***	***	***	***	---	1	6	---	***	***	***	***
Manufacturing facilities, processes, and employees	***	***	***	***	6	1	---	---	***	***	***	***
Channels of distribution	***	***	***	***	8	1	---	---	***	***	***	***
Customer and producer perceptions	***	***	***	***	3	1	2	2	***	***	***	***
Price	***	***	***	***	---	---	2	5	***	***	***	***
737-900 / Max 9 vs. Max 10.-- Physical characteristics and uses	***	***	***	***	---	4	3	---	***	***	***	***
Interchangeability	***	***	***	***	---	2	5	---	***	***	***	***
Manufacturing facilities, processes, and employees	***	***	***	***	6	1	---	---	***	***	***	***
Channels of distribution	***	***	***	***	8	1	---	---	***	***	***	***
Customer and producer perceptions	***	***	***	***	3	1	3	1	***	***	***	***
Price	***	***	***	***	---	---	2	5	***	***	***	***

Note.-- CSLAP, the proposed joint venture between Bombardier and Airbus, completed a U.S. producers' questionnaire based on its plans to assemble 100- to 150-seat LCA at Airbus Americas' facility in Alabama, but has yet to begin operations.

Source: Compiled from data submitted in response to Commission questionnaires.

Physical characteristics and uses

Boeing reported in its questionnaire responses that *** and CSALP ***. However, Boeing reported that 100- to 150-seat LCA have a ***. In addition, 100- to 150-seat LCA generally have a greater nautical mile range than other single-aisle LCA and tend to fly newly created or less dense flight routes. Boeing further noted that differences in seating capacity and ranges affect how the different types of commercial aircraft are used with respect to routes in addition to airport locations and conditions.[72]

American indicated in its questionnaires responses that the 737 family has a ***. Delta reported that it operates ***. Respondents contend that the entire 737 family shares similar characteristics and uses and a dividing line of 150 seats and a minimum range of 2,900

[72] Conference transcript, pp. 44-45 (Anderson); Boeing's postconference brief, pp. 10-11.

nautical miles is not significant since the same aircraft can be configured with either more or fewer than 150 seats.[73]

Interchangeability

Boeing explained that, while 100- to 150-seat LCA can ***. Boeing also noted that other single-aisle LCA cannot serve certain airports at certain times due to their runway size, elevation levels, as well as temperature and humidity levels in surrounding areas. Boeing further explained that airlines plan their fleets in order to optimize the profitability of routes flown, which usually results in a combination of 100- to 150-seat LCA and other single-aisle LCA. Therefore, the different segments of the LCA market play a distinct role in matching demand. These specific profit maximization goals of airlines are ultimately the reason why aircraft with these specific characteristics exist.[74]

United reported that ***, other importer/purchasers (Air Lease, American, BBAM, and Southwest) reported that ***.

[73] Conference transcript, pp. 184-185 (Aranoff); Delta's postconference brief, p. 10; Bombardier's postconference brief, p. 6.

[74] Conference transcript, pp. 45, 78 (Anderson). In addition, higher operating costs for pilots and flight crew associated with other single-aisle LCA is another factor separating these products from 100- to 150-seat LCA. A pilot's compensation is partly based on the size of the aircraft and higher seating capacity incurs higher flight crew costs as the FAA requires an additional flight attendant for passenger-carrying aircraft with over 150 seats. Boeing's postconference brief, p. 12.

Manufacturing facilities, production processes, and production employees

Boeing explained that ***. Boeing further notes that ***. In addition, Boeing indicated that specific tooling must be used in order to meet FAA requirements, and high learning curve costs are incurred when production shifts between different categories of single-aisle LCA.[75]

U.S. importer/purchasers *** reported that 100- to 150-seat LCA and other single-aisle LCA are generally manufactured in the same facilities with the same employees.[76] U.S. importer/purchasers claim that the entire 737 family is manufactured in common facilities with the same employees and a high degree of the same parts because the 737 models all maintain the same basic design even if they increase incrementally in size.[77]

Channels of distribution

Table I-4 presents Boeing's channels of distribution by product type. Boeing indicated in its questionnaire response that 100- to 150-seat LCA are *** to other single-aisle LCA with regard to channels of distribution. Boeing explained that 100- to 150-seat LCA

[75] Conference transcript, pp. 46, 61 (Anderson, Conner); Boeing's postconference brief, p. 13. Specialized tooling is also required when manufacturing the Boeing 727 MAX 7 model as compared to the 737-700 model. Conference transcript, p. 136 (Conner).

[76] *** indicated they are not familiar with the production processes of single-aisle LCA.

[77] Conference transcript, pp. 185-186 (Aranoff); Bombardier's postconference brief, p. 10.

and other single-aisle LCA are ***. Boeing further believes that channels of distribution are not meaningful for the domestic like product analysis.[78]

All but one of the responding U.S. importer/purchasers (***) reported that 100- to 150-seat LCA and other single-aisle LCA are fully comparable in terms of channels of distribution. ***. Since both the petitioner and respondents agree that the channels of distribution for 100- to 150-seat LCA and other single-aisle LCA are the same, Bombardier claims that this factor supports defining the domestic like product to be a continuum consisting of all 737 aircraft.[79]

[78] Boeing's postconference brief, p. 14.
[79] Bombardier's postconference brief, p. 11.

Table I-4
All single aisle LCA: Boeing's channels of distribution by product type

* * * * * * *

Customer and producer perceptions

Boeing indicated in its questionnaire responses that ***. It states that ***. Boeing further states that ***

***.

U.S. importer/purchasers indicated in their questionnaires responses that ***; that ***; that ***; and that ***.

Price

Boeing indicated in its questionnaire responses that ***. Boeing states that ***.

U.S. importer/purchasers indicated in their questionnaires responses that ***; that ***; that ***; that ***; that ***; and that ***.

Table I-5 presents a summary of Airbus Americas' and Boeing's commercial U.S. shipments and total shipments (i.e., including commercial shipments, internal consumption, and export shipments) by product type. *** of 100- to 150-seat LCA, but the average unit values of total shipments of 100- to 150-seat LCA ranged from $*** per unit in January–September 2017 to $*** per unit in January–September 2016. These shipments consisted *** of 100- to 150-seat LCA.[80] The average unit values of Boeing's and Airbus Americas' total shipments of other single aisle LCA ranged from $*** per unit in 2014 to $*** per unit in January–September 2017, ***

[80] Boeing explained that ***.

. The average unit values of Boeing's historical U.S. shipments of 100- to 150-seat LCA, however, ranged from $ per unit to $*** per unit during 2007-13 (see *Infra* table III-8). In addition, the average unit values of Boeing's historical U.S. shipments of other single aisle LCA ranged from $*** per unit to $*** per unit during 2007-13.[81]

Boeing also provided list price data, which show that prices of 100- to 150-seat LCA produced by Boeing range from $82.4 million (737-700) to $92.2 million (737 MAX 7) in 2017. [82] Boeing's list prices of other single aisle LCA in 2017 are as follows: $98.1 million (737-800); $112.4 million (737 MAX 8); $104.1 million (737-900ER); and $119.2 million (737 MAX 9).[83]

[81] Boeing's U.S. producers' questionnaire response, V-3.
[82] Boeing's postconference brief, exh. 12, exh. 30.
[83] Ibid.

Table I-5

All single aisle LCA: Airbus Americas' and Boeing's commercial U.S. shipments and total shipments by product type

* * * * * * *

PART II: CONDITIONS OF COMPETITION IN THE U.S. MARKET

U.S. MARKET CHARACTERISTICS

The U.S. 100- to 150-seat LCA market is characterized by a small number of current and potential producers, a concentrated and relatively small number of purchasers, high-tech long-life assets, and capital intensive production that is subject to scale economies and substantial learning curves. Given these characteristics, there can be limited annual shipments of these aircraft.[1] According to Boeing, the 100- to 150-seat LCA industry accounts for annual sales of "$1 billion" in the United States and $4 billion globally, though sales and shipments can vary substantially from year to year.[2] In addition, U.S. airlines are leaders in the global aviation market, and the U.S. market has the largest existing (as well as aging) fleets of 100- to 150-seat LCA.[3] For this reason, Boeing claims that most of the replacement market globally is in the United States.[4]

According to Boeing, 100- to 150-seat LCA is the smallest category of large civil aircraft. It consists of a standard two-class seating capacity of 100 to 150 seats.[5] 100- to 150-seat LCA are high-tech capital assets that cost tens of millions of dollars each. 100- to 150-seat LCA production is highly capital intensive, where low-volume/high-value products require billions of dollars to develop and produce, and can be expected to last approximately twenty-five years.

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[1] Apparent U.S. consumption of 100- to 150-seat LCA decreased *** during 2014-16, from *** in 2014 to *** in 2015 to *** in 2016. The only commercial shipments of new 100- to 150-seat LCA during this period were by *** selling to ***.

[2] Conference transcript, p. 11 (Novick).

[3] Petition, pp. 72-73.

[4] Conference transcript, p. 93 (Conner).

[5] Petition, p. 34.

Because of the high capital costs and risks, producers often are only able to offer a limited number of product choices. In addition, because 100- to 150-seat LCA producers aim to operate with an order backlog that would take several years to fill, there can be a considerable lag time between orders and deliveries.[6]

Boeing is in the process of developing its first new product offering in the 100- to 150-seat LCA market space since 1993, the Boeing 737 MAX 7, which was launched (i.e., officially announced) in 2011 with deliveries scheduled to begin in 2019.[7] Bombardier has also introduced its C Series, which is the first aircraft designed clean sheet (not a derivative model) in the single aisle market in three decades.[8] Bombardier launched the C Series in 2008 and delivered its first C Series LCA to SWISS in June 2016.[9] In 2016, both the CS100 (108 passengers) and CS300 (130 passengers) received FAA certifications.[10] Similarly, Airbus is offering the Airbus 319neo as a new model of 100- to 150-seat LCA (see Nonsubject imports, below).

After the preliminary phase of these investigations, Bombardier announced an agreement with Airbus to expand production in Airbus Americas' Mobile facility to include C Series aircraft (see Parts I and III). ***. ***

[6] Petition, pp. 17, 46.
[7] Petition, p. 2.
[8] Conference transcript, p. 269 (Mitchell).
[9] Boeing's postconference brief, exh. ER-18.
[10] Conference transcript, p. 156 (Mullot). FAA certification ensures the safety of aircraft before they enter into service. There are four main types: the type certification (design), the production certificate (manufacturing process), the airworthiness certificate (specific units of the aircraft), and the airline operating certificate (operator). Bombardier's postconference brief, app. 29.

***.

Purchasers can also meet demand through used or refurbished 100- to 150-seat LCA. As described by Boeing, used aircraft are part of the total economic equation as purchasers evaluate cost-effectiveness, noting that "{w}hen you buy used aircraft, your operating costs are higher because your maintenance costs are higher. You go to new aircraft, you have far less maintenance costs, but then the used aircrafts may be less fuel-efficient."[11] According to Boeing, however, airlines generally do not look to the used market for their fleet replacement needs, because used aircraft are not available in sufficient quantities. Instead, airlines typically choose to purchase used and/or refurbished aircraft in order to meet a need for additional capacity that cannot be met by producers of new aircraft in the desired delivery timeframe. Boeing estimates that there are on average *** used and/or refurbished 100- to 150-seat LCA available in the global market in a given year. [12]

According to Boeing, the U.S. market for 100- to 150-seat LCA is subject to unique conditions of competition, including programs requiring intensive long-term planning and years of research and development that cost billions of dollars before production can begin. It can take four to seven years to develop new derivatives. As a result, airline manufacturers shoulder

[11] Conference transcript, p. 110-11 (Anderson). Boeing sells both used and new aircraft.

[12] Boeing's postconference brief, app. 17, 18. According to a May 11, 2016 industry article, Southwest and other U.S. airlines were increasingly demanding second-hand jetliners as low-cost fuel made older, less efficient models more economical to operate. Very low fuel prices and currency fluctuations had reduced incentive to buy more fuel-efficient aircraft. In addition, "{Southwest} saw a glut of deeply discounted Boeing 737-700s as the perfect replacement for smaller Boeing 717s that Southwest planned to offload to Delta." Boeing's postconference brief, exh. ER-62.

substantial up-front costs and risks without any guarantee of future commercial success.[13] The need to fund and maintain program development efforts rely on advance orders from customers. Respondents contend, however, that pre-delivery payments "top out at 15 to 20 percent of the contract value {and this} makes it impossible to finance development costs using pre-delivery payments."[14] Another condition of competition cited by Boeing and Respondents is that advance orders drive a virtuous cycle where they validate the program in the marketplace and increase the likelihood of future orders.[15] In order to meet demand and maximize returns on investment, producers must develop aircraft that allow for a variety of preferences and meet the needs of the market years in advance. To accomplish this, producers often develop derivative models of 100- to 150-seat LCA that incorporate a limited number of new, high-impact technologies rather than whole-sale product line changes.[16]

When asked if there had been a change in products in the market since January 1, 2014, responses varied based on interpretations of market presence, but responding firms often identified Bombardier's C Series as recently or currently available in the market. According to Boeing, ***

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[13] There are various types of risk that are associated with aircraft development, including a manufacturer's capital needs, meeting performance requirements, timely delivery, and ability to make sufficient sales to recover launch costs and earn a profit. In addition, reputational risk could be a significant problem. Reputational risk stems primarily from the willingness of purchasers to make large financial commitments to manufacturers that have not been successful or are entering a new market segment. Glennon Harrison, *Challenge to the Boeing-Airbus Duopoly in Civil Aircraft: Issues for Competitiveness*, Congressional Research Service, July 25, 2011, pp. 7, 10.

[14] Conference transcript, p. 167 (Mitchell); see also Bombardier's postconference brief (p. 26) stating that "Initial deposits upon execution of a firm order tend to be between 1% and 5% of the contract value, while overall pre-delivery payments do not exceed 15% to 30% of the contract value. Accordingly, the vast majority of the purchase price is paid only upon delivery."

[15] Petition, p. 1-2. Conference transcript, p. 27 (Conner); Delta's postconference brief, p. 30-31.

[16] Petition, p. 47.

***. Importer/purchaser *** described the C Series as introducing improved fuel consumption, advanced technologies, and improved cabin features into the market, and *** also described the introduction of the C Series as a "significant development." *** described Airbus and Boeing as more interested in markets for larger LCA than 100- to 150-seat LCA.[17]

U.S. IMPORTER/PURCHASERS

In general, the 100- to 150-seat LCA market has a high degree of customer concentration, as the industry consists of a relatively small number of buyers. With only a few potential 100- to 150-seat LCA customers worldwide, annual deliveries are relatively low and sales are concentrated in a few transactions with a few customers placing very large orders. Individual purchases are high value, running into the billions of dollars.

The Commission received thirteen questionnaire responses from firms that import and/or purchase 100- to 150-seat LCA or other single-aisle LCA, including eight that bought 100- to 150-seat LCA during January 2014-September 2017 (table II-1).[18] Seven responding firms are

[17] Overall, six importer/purchasers (including ***) identified changes in the production or marketing of 100- to 150-seat LCA since January 1, 2014, while three (including ***) indicated that there had not been any such changes.

[18] One of these purchaser/importers, *** did not respond to any questions about pricing or market factors. Of the eight responding firms that reported importing and/or purchasing 100- to 150-seat LCA during January 2014-September 2017, *** bought 100- to 150-seat LCA from Boeing (domestic, all used or refurbished), *** bought subject 100- to 150-seat LCA from Bombardier (Canada), *** bought from Airbus (EU, two new and two purchasing used or refurbished).

commercial airline companies, and six are aircraft leasing companies.[19] These firms reported making sporadic purchases for new or used/refurbished subject product from Boeing or Airbus since January 1, 2014, and none from Bombardier. One leasing company, ***, noted that its business model is to ***.

Table II-1
100- to 150-seat LCA: List of importer/purchasers, their total imports/purchases, by source, January 2014-September 2017

Firm	Total reported imports and/or purchases during January 2014-September 2017 (units)					
	United States (Boeing)		Canada (Bombardier)		European Union (Airbus)	
	New	Used/ refurbished	New	Used/ refurbished	New	Used/ refurbished
Air Lease	***	***	***	***	***	***
Alaska	***	***	***	***	***	***
American	***	***	***	***	***	***
ACG	***	***	***	***	***	***
BBAM	***	***	***	***	***	***
Boeing Capital	***	***	***	***	***	***
BofA	***	***	***	***	***	***
Delta	***	***	***	***	***	***
GECAS	***	***	***	***	***	***
Southwest	***	***	***	***	***	***
United	***	***	***	***	***	***
Virgin America	***	***	***	***	***	***
Total	***	***	***	***	***	***

Note.--*** is not included in the table because its final-phase questionnaire was not complete.

Source: Compiled from data submitted in response to Commission questionnaires.

[19] ***.

SUPPLY AND DEMAND CONSIDERATIONS

U.S. supply

Domestic production

Boeing is currently the only domestic producer of 100- to 150-seat LCA. Airbus Americas commenced aircraft assembly at its Mobile, Alabama plant in July 2015, but does not currently manufacture 100- to 150-seat LCA domestically. In the short term, the domestic industry does not have the ability to respond to changes in demand with changes in the quantity of shipments of U.S.-produced 100- to 150-seat LCA, due to the long delivery times and high level of capacity utilization in the domestic aircraft market. In the longer term, however, the domestic industry appears to have the capability to respond to changes in demand with moderate changes in the quantity of shipments of U.S.-produced 100- to 150-seat LCA. The main contributing factor to this degree of responsiveness of supply is the ability to shift production to or from out-of-scope LCA and the ability to shift shipments from alternate markets. Factors mitigating responsiveness of supply, particularly in the short term, include long order-to-delivery lag times, customer-specific produced-to-order product, and lack of inventories.

Industry capacity

Because orders for 100- to 150-seat LCA are received years in advance of their delivery date, Boeing's production rate is reportedly set at a level that ensures the most efficient use of workforce, PPE (property, plant, and equipment), and other assets.[20] Accordingly, reported

[20] Boeing reported that the average duration between order date and delivery date is ***. *See* "Lead times" in this section of the report for an expanded discussion on lead times.

capacity utilization is at or around *** percent.[21] The overall capacity for the domestic industry to produce LCA (including both in-scope 100- to 150-seat LCA and other out-of-scope single aisle LCA) increased between 2014 and 2016, from *** to ***. The share of 100- to 150-seat LCA produced compared to other single aisle LCA decreased during this time, from *** percent of total production (***) in 2014 to *** percent of total production (***) in 2016.

Boeing projected its overall capacity and production of 100- to 150-seat LCA to increase ***. Airbus Americas ***. In October 2017, Airbus Americas and Bombardier announced that Airbus would acquire a majority stake in Bombardier's C Series. According to Airbus, "primary assembly" will remain in Canada, but final assembly of product for U.S. customers is planned for Alabama.[22]

Overall, *** projected increases in the total number of LCA produced, from ***

[21] Boeing indicated that ***. Boeing reported that ***.

[22] Airbus, "Airbus and Bombardier Announce C Series Partnership," October 16, 2017 http://www.airbus.com/newsroom/press-releases/en/2017/10/airbus-bombardier-cseries-agreement.html downloaded November 24, 2017.

***. *** also projected that they will ***.

This high level of capacity utilization indicates that U.S. producers do not have the ability to increase production of 100- to 150-seat LCAs in the short term in response to an increase in prices. Boeing reported that ***. Boeing therefore appears to have some potential to increase production of 100- to 150-seat LCA in the longer term in response to an increase in prices.

Alternative markets

Boeing's exports, as a share of total shipments, fluctuated during 2014-16, increasing from *** percent in 2014 to *** percent in 2015, then decreasing to *** percent in 2016. Boeing's total export shipments ***. According to Boeing, the two next-largest markets for aircraft after the United States are China and Europe, which are subject to political pressure to purchase locally produced aircraft.[23]

[23] Petition, p. 73.

Inventory levels[24]

Due to the tightly planned nature of production, the U.S. producer holds *** inventories, indicating that it does not have the ability to respond to changes in demand with changes in the quantity shipped from inventories.

Production alternatives[25]

Boeing reported that ***. Airbus Americas reported that since it does not produce in-scope LCA, *** switch production from other products to 100- to 150-seat LCA.

Supply constraints

Boeing reported that it *** refused, declined, or been unable to supply 100- to 150-seat LCA since January 1, 2014. As of September 30, 2017, Boeing's backlog for the 737 family of LCA was 4,431 planes.[26] In the preliminary phase of these investigations, Bombardier claimed that a similar amount represented a seven-to-eight year backlog.[27]

[24] Both Boeing and Bombardier stated that product is not produced for inventory; inventory, also known as "white-tails," are not a deliberate part of industry. Conference transcript, p. 86, 260 (Novick, Mitchell).

[25] *See Part III* for additional information on alternative products.

[26] Boeing, "Commercial Airplanes Fact Sheet," http://investors.boeing.com/investors/fact-sheets/default.aspx (accessed on November 30, 2017). Boeing also plans to increase production of the 737 aircraft from 47 units per month in 3Q2017 to 52 units per month in 2018, to 57 units per month in 2019.

[27] Conference transcript, pp. 17, 190 (Lichtenbaum, Aranoff).

U.S. producers were asked how often their firms had delayed delivery of 100- to 150-seat LCA. For the period January 1, 2007 to December 31, 2013, ***. For the period January 1, 2014 to the present, ***.

*** stated that ***. No other importer/purchaser reported any supply constraints by U.S. producers.

Subject imports from Canada[28]

Bombardier is currently the only Canadian producer and exporter of 100- to 150-seat LCA. Bombardier began working on the C Series in the mid-2000s in order to enter the 100- to 150-seat LCA market, and launched the program in 2008. Bombardier delivered its first 100- to 150-seat LCA in June 2016 to SWISS.[29] Bombardier has not yet exported any 100- to 150-seat LCA from Canada to the United States.[30]

[28] For data on the number of responding foreign firms and their share of U.S. imports from Canada, please refer to Part I, "Summary Data and Data Sources."

[29] Petition, pp. 8, 9, 27, 31.

[30] Petitioner also reports that "although Republic Airlines has placed an order for 40 CS300s, it is unclear that these orders will ever be delivered in light of Republic Airways' poor financial condition." Petition, pp. 27, 29, n. 86. Bombardier bid data (from the preliminary phase of these investigations) noted that the ***."

Based on available information, producers of 100- to 150-seat LCA from Canada do not have the ability to respond to changes in price in the short term, but do have the ability to respond to changes with moderate changes in the quantity of shipments of 100- to 150-seat LCA to the U.S. market in the longer term. The main contributing factors to this degree of responsiveness of supply are the potential for increasing amounts of available capacity. Factors mitigating Bombardier's responsiveness of supply include a lack of inventories and the limited ability to shift production to or from alternate products.

Industry capacity

Bombardier reported that its overall capacity and production to produce 100- to 150-seat LCA was *** units in 2014 and 2015, *** in 2016 and *** in January-September 2017. Similar to Boeing, Bombardier's reported that capacity utilization was ***.[31] Bombardier projected its overall capacity of 100- to 150-seat LCA to increase ***. It projected that its total capacity would increase ***, *** its production of 100- to 150-seat LCA would increase ***, as it began producing more product in Alabama. These projected levels of capacity utilization suggest that Bombardier has very limited ability to increase production of 100- to 150-seat LCAs in the short term in response to an increase in prices, but may have a moderate-to-substantial ability to increase production of 100- to 150-seat LCA in the long term.

[31] Bombardier reported attempting to maintain a book-to-bill ratio of ***.

Alternative markets

Bombardier reported shipping *** to ***, and ***. It projected that its shipments to these alternative markets will decrease from *** percent in 2017 to *** percent in 2021, while its shipments to the U.S. market and its home market will both increase, from *** percent in 2017 to *** and *** percent in 2021, respectively.

Inventory levels[32]

Similar to Boeing, Bombardier reported holding no inventories of 100- to 150-seat LCA, indicating that Bombardier has limited ability to respond to changes in demand with changes in the quantity shipped from inventories.

Production alternatives

Bombardier reported that it could not switch production from 100- to 150-seat LCA to other products.[33] Bombardier produces a number of other out-of-scope aircraft, ***.

Supply constraints

Bombardier reported ***. ***

[32] Both Boeing and Bombardier stated that product is not produced for inventory; inventory, also known as "white-tails," are not a deliberate part of industry. Conference transcript, p. 86, 260 (Novick, Mitchell).

[33] Other aircraft produced by Bombardier are regional aircraft, not LCA.

***.

Foreign producers were also asked to provide details on how often they had deferred delivery of 100- to 150-seat LCA since January 1, 2007. Bombardier stated that ***.

No importer/purchaser reported any supply constraints by the Canadian producer.

Nonsubject imports

According to questionnaire data, nonsubject imports *** accounted for *** imports of new 100- 150-seat LCA since 2014. No importer/purchaser reported any supply constraints by any nonsubject-country producers.

Airbus launched its A319 (currently known as the A319ceo) in 1993, and it is scheduled to remain in production through 2018.[34] The A319neo was launched in 2010, and is scheduled

[34] Petition, p. 30.

to enter into service in 2018.[35] Although there are emerging aircraft producers in China and Russia, these producers continue to face challenges, including getting orders from established carriers, budget and schedule over-runs, and delays in establishing a track record of reliable, safe, and trouble-free operation.[36]

U.S. demand

Based on available information, the overall demand for 100- to 150-seat LCA is likely to experience small-to-moderate changes in response to changes in price. The main contributing factor to this is the availability of substitutes (namely smaller or larger aircraft), the ability of purchasers to extend aircraft service life in the short-term, and some ability to alter networks to optimize returns based on a different cost structure (in the longer-term). Demand responsiveness is mitigated, however, by the economic viability of substitute aircrafts. According to Boeing, demand for new 100- to 150-seat LCA is divided between (1) replacement demand – the need to replace aging aircraft, and (2) growth demand – the need to grow fleet size. Replacement demand can be projected based on the age of aircraft in airline fleets, and based on Boeing's projections, U.S. airlines will require approximately *** new 100- to 150-seat LCA delivered by 2028. Given the typical lag between orders and deliveries, "it is highly likely that orders to replace most of these units will be made in the next five years."[37] In addition, Boeing estimates that the 100- to 150-seat LCA will account for ***

[35] The term "neo" stands for new engine option, and the term "ceo" stands for current engine option. Petition, p. 30.

[36] Deloitte, "2017 Global aerospace and defense sector outlook," 2017, p. 5.

[37] Boeing's postconference brief, app. 3-4.

***.[38]

Overall, demand for 100- to 150-seat LCA depends on demand by airline and airplane leasing companies for 100- to 150-seat LCA, which in turn is driven by passenger air travel demand. In addition to economic and industry indicators, Delta notes that demand is also driven by the specific "mission profile" of each airline as it evaluates its operations, network, and fleet to meet current and future needs.[39] Economic indicators and airline industry demand drivers show steady growth during 2014-16 and the first nine months of 2017, as shown below.

Passenger air travel is largely affected by growth in gross domestic product (GDP), consumer confidence, and disposable income.[40] Overall, real disposable income and real GDP have increased steadily since 2007, while consumer sentiment dropped relatively more during the Great Recession (2008-2009) and has been rising intermittently since (figure II-1). Between the first quarter of 2007 and the first quarter of 2014, consumer sentiment decreased by 12.3 percent, while real disposable income and real GDP increased by 8.6 and 7.0 percent,

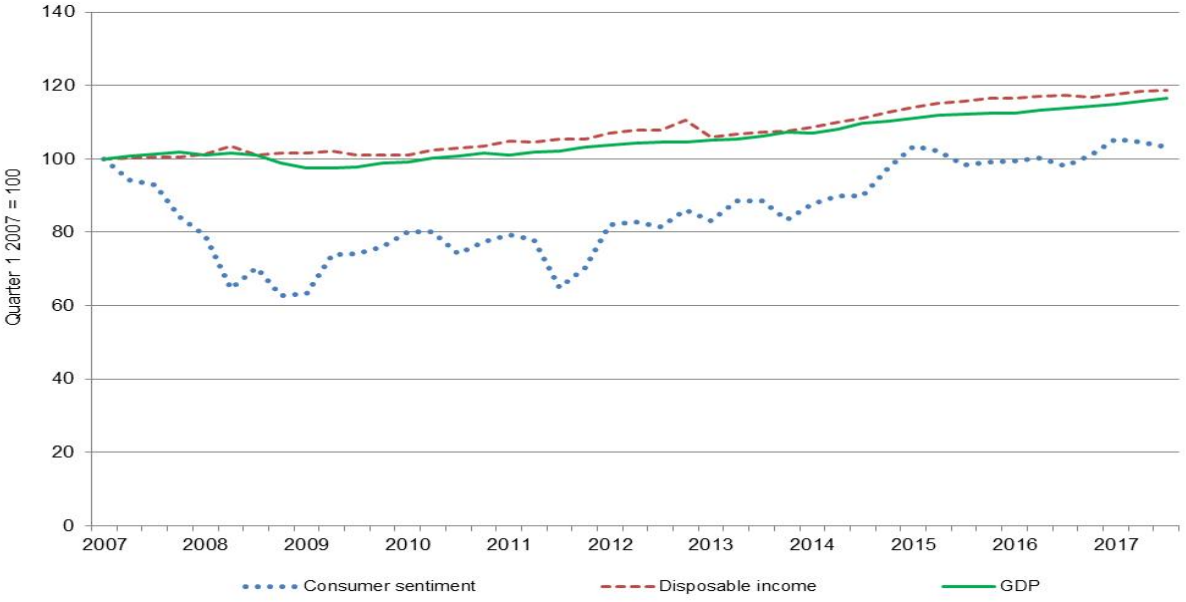
[38] "***."Boeing's postconference brief, app. 15-16. According to an Oliver Wyman market forecast, "Small narrow-bodies with a seat count ranging between 100 and 150 seats currently make up 23% of the passenger narrow-body fleet. Only 11% of narrow-bodies are forecast to be in this size in 2027." Boeing's postconference brief, exh. ER-6.

[39] Delta's postconference brief, p. 15.

[40] In developed markets, demand for essential travel has been met, so growth comes from discretionary travel, and GDP per capita matters less. Other factors such as the availability of vacation days earned, the funds needed to travel, consumer confidence, service pricing, and service quality have a greater impact on demand. Boeing, "Current Market Outlook 2016–2035," p. 22.

respectively. Between the first quarter of 2014 and the third quarter of 2017, consumer sentiment, real disposable income, and real GDP all increased by 17.6, 9.2, and 8.9 percent, respectively. According to the October 2017 *Blue Chip Economic Indicators*, the consensus forecasts for 2018 real GDP and real disposable income growth are *** and *** percent, respectively.[41]

Figure II-1
Demand driving factors: Indexes of consumer sentiment, real disposable income, and real GDP in the United States, quarterly, January 2007-September 2017



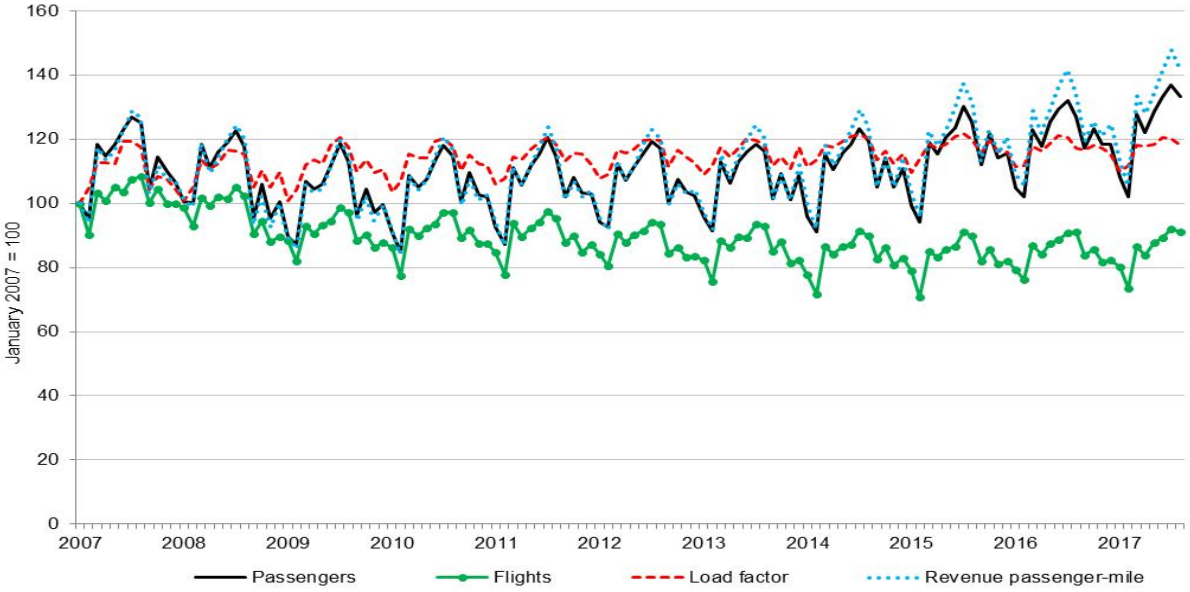
Source: St. Louis Federal Reserve, Federal Reserve Economic Data (FRED). Retrieved November 3, 2017.

Additionally, Boeing stated that ***.

[41] *Blue Chip Economic Indicators* is a publication that assembles numerous economic forecasts for U.S. economic indicators. *Blue Chip Economic Indicators*, vol. 42, no. 10, October 10, 2017.

According to air travel data collected from the Bureau of Transportation Statistics, the number of domestic passengers, domestic load factor,[42] and domestic revenue passenger-mile[43] have all increased since 2007, while the number of domestic flights has decreased (figure II-2). Between January 2007 and January 2014, the total number of passengers and flights decreased, by 4.1 and 22.3 percent, respectively, as did revenue per passenger-mile, by 0.8 percent. However, load factor increased, by 11.5 percent. Between January 2014 and January 2017, the total number of passengers, flights, and revenue passenger-mile all increased, by 12.8, 3.2, and 14.8 percent, respectively, while load factor decreased by 1.5 percent.[44] The decreasing number of flights and increasing load factor may have affected the overall demand for aircraft.

Figure II-2
Airline data: Indexes of domestic passengers, domestic flights, domestic load factor, and domestic revenue passenger-miles among all U.S. carriers, monthly, January 2007-August 2017



Source: Bureau of Transportation Statistics, T-100 Market data. Retrieved November 16, 2017.

[42] Load factor, which measure the number of seats sold in terms of total seats available, is calculated by dividing revenue passenger-miles by available seat miles.

[43] Revenue passenger-mile is calculated by dividing the number of passengers by the distance flown.

[44] Data in figure II-2 go through August 2017, but are not summarized here because of the visible seasonal effect.

Business cycles

No firm reported that the market for 100- to 150-seat LCA was subject to business cycles, but *** and 2 of 10 responding importer/purchasers indicated that the market was subject to distinct conditions of competition. *** reported that ***. *** reported that the 100- to 150-seat LCA market was not subject to business cycles or distinct conditions of competition. Importer/purchaser *** reported that used aircraft (including the Boeing 717, which is no longer in production) and new Embraer 190 and 195 compete with new aircraft in the 100- to 150-seat LCA market. However, it noted that none of these aircraft meet the definition of 100- to 150-seat LCA.

*** and importer/purchaser *** stated that there had not been any changes to the conditions of competition since January 1, 2014. Other importer/purchasers did not answer the question.

Fleet replacement

U.S. importers were asked what percentage of 100-to-150-seat LCAs in their fleet that they anticipated replacing with new 100-to-150-seat LCAs and/or other aircraft. Five firms responded, generally describing their fleet replacement as having a long time horizon.

*** stated that it expected to replace *** percent of its existing fleet of 100- to 150-seat LCA in ***, and *** in ***, anticipating that ***. *** stated that it ***. *** anticipated *** fleet with ***. *** anticipated replacing only *** percent in 2 to 5 years, *** percent in 5 to 10 years, and *** percent in more than 10 years from now. *** anticipated *** fleet with ***.

U.S. importer/purchasers were also asked what percentage of other aircraft (not 100- to 150-seat LCAs) in their fleet they anticipated replacing with new 100-to-150-seat LCAs. Three firms responded, generally not anticipating replacement of other aircraft with 100- to 150-seat LCAs. *** stated that it ***. *** stated that it planned to replace ***. *** also stated that it planned to ***.

Commercial momentum

In the preliminary phase of these investigations, Boeing stated that the 100- to 150-seat LCA industry is characterized by "commercial momentum" or a potential for positive and negative feedback cycles. It stated that customers are far more likely to place follow-on orders for the same 100- to 150-seat LCA than to order another producer's competing product. In addition, other customers are more likely to purchase from a producer who is experiencing positive commercial momentum, especially if the momentum is driven by orders from large, well-respected airlines. This likelihood is driven by both mimicking and by the economic advantages of market acceptance, including higher residual value, easier financing, superior lifetime support costs, and a reduced likelihood of early production termination. Consequently, sales lead to more sales and lost sales lead to fewer sales.[45] Positive commercial momentum also affects production efficiency by increasing the rate at which the producer moves up the learning curve, lowering its marginal cost, and facilitates access to economies of scale effects through volume discounts on input purchases.[46] However, in the preliminary phase of the investigations, Bombardier stated that ***."

Of the three importer/purchasers that provided substantive responses in the preliminary phase, *** indicated that recent market sales performance has ***." Similarly, ***

[45] Petition, pp. 17, 18, 51.

[46] Petition, p. 52. In addition, Petitioner states that orders are critical to both the particular transaction and the manufacturer's viability because order contracts ordinarily provide for an initial deposit and pre-delivery payments. These payments are "critical" for cash flow and program development. Petition, p. 18.

responded that prior market sales did not impact sales performance at all, and that, ***."[47] Finally, *** responded that prior market sales performance had "little or no impact" on its purchasing decisions.

In the final phase of these investigations, importer/purchasers were asked if commercial momentum played a role in their decisions to purchase 100- to 150-seat LCA from specific producers. Five (***) answered that it did not, while six (*** stated that commerical momentum is more relevant for lessors, because it may be difficult to finance an aircraft that is selling poorly. *** stated that commercial momentum does not impact the sales of used aircraft. *** described performance assurance as a reason commercial momentum played a role in their decisions, and *** described commercial momentum as having a large effect or being very important. However, *** described commercial momentum as playing a small role in its purchasing decisions.

Lifecycle costs

100- to 150-seat LCA have long life expectancies; life expectancy estimates ranged from 20 to 30 years. Respondents estimated that the purchase price of a 100- to 150-seat LCA

[47] Delta adds that it is not familiar with any industry-recognized concept of "commercial momentum." Delta's postconference brief, p. 31.

typically represents at most 25 percent of the direct operating costs over the airplanes life.[48] The subsequent operating costs represent the large majority of the lifetime cost of a plane—about three times the initial purchase price.[49]

Lifecycle costs, or the sum of all these recurring and one-time costs over the full life span of a product, are an important factor in the purchase of 100- to 150-seat LCA. Firms were asked to identify which factors purchasers consider in determining 100- to 150-seat LCA lifecycle costs. *** reported that the most critical factors that contribute to lifecycle costs are the cost of ownership (i.e., purchase price or financing cost), expected operating costs; fuel efficiency; pilot and crew classification and requirements; pilot and crew training costs; maintenance, repair, and overhaul ("MRO") costs; operational reliability; and residual value.[50] Among other responding importer/purchasers, the most common responses were maintenance costs (cited by 6 firms), fuel burn/fuel efficiency (5 firms), purchase price/initial acquisition (4 firms), crew costs (4 firms), financing costs (2 firms), and ownership costs (2 firms). *** reported that firms will consider cash operating costs, ownership/financing costs, support costs, crew transition/training costs, and residual value.

[48] Conference transcript, p. 165 (Mitchell). Delta notes that aircraft acquisition costs represents less than 20 percent of the total operating (i.e., "seat") costs. Delta's postconference brief, p. 21.

[49] Bombardier's postconference brief, p. 23.

[50] "Although maintenance, repair, and overhaul (MRO) spending generally amounts to less than 10 percent of total annual operating expenses, long lasting assets, such as airframes and engines, require ongoing maintenance and repairs, as well as overhauls as planes age. Over the course of an aircraft's lifespan, engines account for 46% of maintenance, repair, and overhaul (MRO) spending, while airframes account for the rest." Glennon Harrison, *Challenge to the Boeing-Airbus Duopoly in Civil Aircraft: Issues for Competitiveness*, Congressional Research Service, July 25, 2011, p. 16.

In addition, questionnaire recipients were asked to provide net present value calculations for the top five factors contributing to lifecycle costs (table II-2). ***. Importer/purchasers reported that ownership costs, fuel costs, and maintenance costs were among the most important costs considered in the purchase decisions for 100- to 150 seat LCA.

Table II-2
100- to 150-seat LCA: Firms' responses regarding largest factors influencing lifecycle costs for 100- to 150-seat LCA

* * * * * * *

Demand trends

*** and a plurality of responding importer/purchasers reported that demand for 100- to 150-seat LCA in the United States had fluctuated since January 1, 2014 (table II-3). Boeing explained that ***.[51] Bombardier reported that ***.

Table II-3
100- to 150-seat LCA: Firms' responses regarding U.S. demand and demand outside the United States, by number of responding firms

Item	Increase	No change	Decrease	Fluctuate
Demand in the United States				
Boeing	***	***	***	***
Importer/purchasers	2	2	1	4
Bombardier	***	***	***	***
Demand outside the United States				
Boeing	***	***	***	***
Importer/purchasers	3	1	1	2
Bombardier	***	***	***	***

Note.--***.

Source: Compiled from data submitted in response to Commission questionnaires.

[51] See also conference transcript, pp. 35-36 (Nickelsburg).

Among importer/purchasers, *** reported that demand for 100- to 150-seat LCA has generally decreased in the United States due to their high operating costs, and that demand has increased for 76-seat large regional jets (such as the Embraer E175 and Bombardier CRJ-900) because they can be operated at lower costs at regional airlines. *** reported that demand trends for 100- to 150-seat LCA generally track the demand for air transportation services, and that the demand for air transportation services in U.S. markets has increased on average by approximately 6.3 percent per year since 2014 (based on Department of Transportation O&D passenger survey data), and 5.6 percent for international air travel.[52] *** indicated that there had been a growth in demand for larger aircraft outside the U.S. market, while *** reported slightly lower demand for widebody aircraft both domestically and internationally.

Substitute products

According to Boeing, the 100- to 150-seat LCA is optimal for a large number of routes operated by U.S. airlines that include many less populous destinations, because this model allows for more frequent flights with few passengers, has lower pilot costs, and can serve airports with shorter or obstacle-impaired runways.[53] In addition, because of the seating capacities of 100- to 150-seat LCA, other Boeing large civil aircraft are significantly larger and would force the customer to bear higher operating costs without any passenger revenue

[52] "The Airline Origin and Destination Survey is a 10 percent sample of airline tickets from reporting carriers collected by the Office of Airline Information of the Bureau of Transportation Statistics. Data includes origin, destination and other itinerary details of passengers transported. This database is used to determine air traffic patterns, air carrier market shares and passenger flows." *Department of Transportation website, Bureau of Transportation Statistics, Overview,* https://www.transtats.bts.gov/DatabaseInfo.asp?DB_ID=125, accessed on May 25, 2017.

[53] Conference transcript, p. 34 (Nickelsburg).

benefits. "*** from the perspective of the manufacturer."[54]

U.S. importer/purchasers were asked to rate the degree to which other types of aircraft (including regional civil aircraft, other single aisle LCA, all other LCA, and other aircraft) can be substituted for 100- to 150-seat LCA. As shown in table II-4, most firms reported that other types of listed aircraft can "sometimes" be substituted for 100- to 150-seat LCA.

Table II-4
100- to 150-seat LCA: Substitutability with other types of aircraft, as reported by U.S. importers/ purchasers, by number of responding firms

Type of substitute	Always	Frequently	Sometimes	Never
Regional civil aircraft	0	0	7	1
Other single aisle LCA	0	3	5	0
All other LCA	0	0	5	3
Other aircraft	0	0	4	0

Note.--Regional civil aircraft includes aircraft either (a) with seat counts less than 100 intended for civil uses or (b) aircraft with seat counts between 100 and 150 that do not otherwise conform to in-scope 100- to 150-seat LCA (e.g., Embraer 190, Bombardier CRJ 700, CRJ 900, and CRJ 1000).

Other single aisle LCA includes large civil aircraft with a single aisle that do not meet the definition of 100- to 150-seat LCA as defined on page 2 or regional civil aircraft as defined above (e.g., Boeing 737-800/737 MAX 8, 737-900/737 MAX 9, 737 MAX 10, and Airbus A320 and A321). All other LCA includes large civil aircraft not included in the definition of 100- to 150-seat LCA as defined or as "other single aisle LCA" as defined above (i.e., LCA with more than one aisle). This category includes jumbo, two-aisle models.

Source: Compiled from data submitted in response to Commission questionnaires.

*** reported that while 200- to 300-seat aircraft are not generally substitutable for 100- to 150-seat LCA, other larger single-aisle aircraft (such as a Boeing 737-800) can be substituted for 100- to 150-seat LCA (such as an Airbus A319) when the larger aircraft takes over a route with high demand and reduces the number of trip frequencies. It added that it is possible to substitute a smaller regional aircraft (such as an Embraer E175) for a 100- to 150-

[54] Petition, p. 44.

seat LCA and increase the trip frequencies. *** reported that is also possible to substitute an A319 with a Boeing 757 in some high altitude, hot, or short-runway markets.

*** also reported that some aircraft are substitutes for 100- to 150-seat LCA. It stated that on the lower-end of the range of size or distance in the definition of 100- to 150-seat LCA, in-scope aircraft (such as the Bombardier CS100) competes with out-of-scope aircraft such as those of Embraer, or used Boeing 717s and MD 88s. It also stated that at the high end of the seating or size range, other out-of-scope products such as the Airbus 320 can compete with larger 100- to 150-seat LCA.

Other importer/purchasers named seating, range, payload, and landing field capabilities as factors that may affect the substitutability of 100- to 150-seat LCA for the other products listed.

Five importer/purchasers reported how much they used 100- to 150-seat LCA on their routes in 2016.[55] Reported use of subject aircraft in their networks varied substantially. Airline companies reported using 100- to 150-seat LCA on *** percent (***), *** percent (***), *** percent (***), *** percent (***), and *** percent (***) of their network measured by routes. They also reported using 100- to 150-seat LCA on *** percent (***), *** percent (***), *** percent (***), *** percent (***), and *** percent (***) of their network measured by total miles.

When asked how often smaller aircraft (with fewer than 100 seats) were used on the same routes as 100- to 150-seat LCA in 2016, *** responded it did so on *** percent of

[55] The remaining firms did not provide responses.

its routes, accounting for *** percent of its miles. *** responded that it did so for *** percent of its routes, accounting for *** percent of its miles.[56] *** responded that it did so for *** percent of its routes, accounting for *** percent of its miles.

When asked how often larger aircraft (with more than 150 seats) were used on the same routes as 100- to 150-seat LCA in 2016, *** responded it did so on *** percent of its routes, accounting for *** percent of its miles. *** responded that it did so for *** percent of its routes, accounting for *** percent of its miles. *** responded that it could do so for *** percent of its routes, accounting for *** percent of its miles. *** responded that it did so for *** percent of its routes, accounting for *** percent of its miles.

Importer/purchasers were asked how the availability of used or refurbished 100- to 150-seat LCA affects their purchase decisions. Most responding firms indicated that the availability of used product can have at least some impact on their firms' purchasing decisions. *** stated that it had begun ***. *** stated that it had seen an increasing number of used 100- to 150-seat LCA in the market in recent years, diminishing its interest in purchasing new product. *** also indicated that they took the availability of used product into consideration. However, *** stated that it has not historically purchased used product due to the cost to standardize different used aircraft. *** stated that it has taken used 100- to 150-seat LCA into consideration when it

[56] In the preliminary phase, when asked for the percent of routes for which larger or smaller aircraft "can" be substituted for 100- to 150-seat LCA, United responded *** percent for ***; Delta responded *** percent for larger aircraft, but only *** percent for smaller aircraft; and Southwest responded *** percent for larger aircraft, and *** percent for smaller aircraft.

needed supply more quickly than manufacturers could meet with new aircraft. *** indicated that it purchases both used and new product on a case-by-case basis.

SUBSTITUTABILITY ISSUES

The degree of substitution between domestic and imported 100- to 150-seat LCA depends upon such factors as relative prices, quality (e.g., reliability of supply, defect rates, etc.), and conditions of sale (e.g., price discounts/rebates, lead times between order and delivery dates, payment terms, product services, etc.). Based on available data, staff believes that there is moderate-to-high degree of substitutability between domestically produced 100- to 150-seat LCA and Canadian-produced 100- to 150-seat LCA.

Importance of specific purchasing factors

Importer/purchasers were asked to rate the importance of 22 factors in their purchasing decisions (table II-5). The factors rated as "very important" by at least six responding firms were availability, lifetime operating costs (seat and trip), maintenance costs, payment terms, performance, price,[57] reduced fuel requirements, and seat capacity. The factors rated as "not important" by at least half of responding importers included trade-in commitments (6 firms) and residual value guarantees (5 firms).

[57] *** responded that price was not important.

Table II-5
100- to 150-seat LCA: Importance of purchase factors, as reported by U.S. importer/purchasers, by factor

Factor	Very important	Somewhat important	Not important
Availability/backlog	6	1	2
Cabin comfort	2	4	3
Commensurate pricing (i.e., most favored customer agreement)	4	1	4
Commonality with existing fleet	4	2	3
Delivery terms	4	1	4
Emissions requirements	3	4	2
Engine size	2	3	4
Entry-into-service support	4	2	3
Lifetime operating costs (seat and trip)	6	1	2
Maintenance costs	6	2	1
Noise requirements	3	4	2
Payment terms	6	1	2
Performance (landing, take-off, range)	6	1	2
Price	7	1	1
Range greater than 2900 nautical miles	2	3	4
Reduced fuel requirements	6	2	1
Residual value guarantees	3	0	5
Seat capacity	6	2	1
Spare parts	4	2	3
Superior technology	3	5	1
Trade-in commitments	2	1	6
Training support	3	3	3

Source: Compiled from data submitted in response to Commission questionnaires.

Several firms provided explanations for the roles these factors play in their bidding and purchasing decisions. *** reported that if an aircraft is not available in the time frame required, it will not be considered. It also indicated that its ability to *** meant that it had some flexibility in the *** areas. *** indicated that entry-into-service and training support is very important when the aircraft is the first of its type in the fleet. Both *** indicated that lifetime operating costs (and maintenance costs) are some of the most important factors. Among ***, *** indicated that commensurate pricing is the key factor in purchasing aircraft as it has a direct

correlation to the profitability of ***. It added that fuel efficiency and engine reliability are more important than engine size.

Importer/purchasers were asked how a manufacturer's ability to deliver 100-to 150-seat LCA within a specified time frame affects its competitiveness. *** described it as a "critical" factor. Several others described it as important, but sometimes qualified it as not the only issue. For example, *** described meeting its needs on time as a definite advantage to a manufacturer's competitiveness, but not necessarily a "deal-breaker." *** stated that meeting delivery deadlines "improves" the competitiveness both of the supplier and the airline.

Additionally, importer/purchasers were asked to rate the importance of several other reputational purchasing factors with regard to purchasing decisions for existing/current 100- to 150-seat LCA, derivative new model 100- to 150-seat LCA, and clean sheet new model 100- to 150-seat LCA. Their answers are summarized in table II-6. Their responses did not vary much by type of 100- to 150-seat LCA ordered, with most purchasers rating most factors as very or somewhat important. Factors were slightly more likely to be important for clean sheet new models than existing models, and for existing models than derivative. In additional comments, *** stated that the primary factors in its purchase decisions are ***. It added that the factors in table II-6 are given consideration to the extent they affect those primary factors. For example, it noted that prior performance and purchases are very important because they allow ***. *** explained that lessors want an aircraft with broad industry acceptance. Most "not important" answers came from ***, the latter of which explained that its purchasing decisions are ***.

Table II-6
100- to 150-seat LCA: Importance of reputational purchase factors, as reported by U.S. importer/purchasers, by factor

Existing/current 100- to 150-seat LCA			
Factor	**Very important**	**Somewhat important**	**Not important**
Prior domestic sales	4	3	3
Prior global sales	4	5	1
Domestic market performance	4	3	3
Global market performance	4	5	1
Length of time in domestic market	2	5	3
Proven performance record at U.S. airline	4	4	2
Proven performance record at a non-U.S. airline	4	4	2
Prior purchases of 100- to 150-seat LCA from the same manufacturer	4	3	3
Prior purchases of other single aisle LCA from the same manufacturer	4	3	2
Derivative new model of 100- to 150-seat LCA			
Factor	**Very important**	**Somewhat important**	**Not important**
Prior domestic sales	4	3	3
Prior global sales	4	5	1
Domestic market performance	4	3	3
Global market performance	4	5	1
Length of time in domestic market	2	5	3
Proven performance record at U.S. airline	3	5	2
Proven performance record at a non-U.S. airline	3	5	2
Prior purchases of 100- to 150-seat LCA from the same manufacturer	4	3	3
Prior purchases of other single aisle LCA from the same manufacturer	4	3	2

Table continued on next page.

Table II-6--Continued
100- to 150-seat LCA: Importance of reputational purchase factors, as reported by U.S. importer/purchasers, by factor

Clean sheet new model of 100- to 150-seat LCA			
Factor	**Very important**	**Somewhat important**	**Not important**
Prior domestic sales	4	3	3
Prior global sales	4	5	1
Domestic market performance	4	3	3
Global market performance	4	5	1
Length of time in domestic market	3	4	3
Proven performance record at U.S. airline	5	2	3
Proven performance record at a non-U.S. airline	5	3	2
Prior purchases of 100- to 150-seat LCA from the same manufacturer	4	2	3
Prior purchases of other single aisle LCA from the same manufacturer	4	3	2

Source: Compiled from data submitted in response to Commission questionnaires.

Another important factor in purchasing pattern decisions is fleet composition and fleet complexity.[58] For airline companies, fleet complexity provides flexibility with different aircraft, but also increases costs because the variety of aircraft requires additional support, different parts inventories, and various different training programs for the crew and maintenance personnel. Fleet complexity can result from airline intent or by merger. An airline or leasing company's fleet complexity also affects producers. If the airline already has aircraft from

[58] "Fleet composition choice is one of the most important strategic decisions that airlines have to face, not only because of the huge investment deriving from a new aircraft purchase and the long payback period, but also because this choice affects their operating costs and their strategy in selecting which routes to serve. The challenge in fleet planning is to balance the benefits of a uniform fleet (in terms of same aircraft model and same engine type) and the choice of different aircrafts for different routes." Carolina Billitteri and Giovanni Perrone, "How do airlines preferences about engines influence the competition in the commercial aircraft industry: an empirical analysis," *Proceedings of the 2011 International Conference on Industrial Engineering and Operations Management*, Kuala Lumpur, Malaysia, January 22 – 24, 2011, p. 718.

different producers, producers are better able to compete with each other.[59] Petitioner notes that fleet complexity or commonality is more important for smaller airlines where the cost of multiple types of planes can be costly. However, for larger airlines, particularly those that developed complex fleets due to industry mergers and consolidation, commonality and the cost of complexity becomes less important in purchasing decisions.[60] For example, Delta notes that it is a "believer in a diversified fleet;" having aircraft from every major manufacturer allows it to closely match its fleet to its specific mission profile.[61]

Changes in purchasing patterns

Importer/purchasers were asked about changes in their purchasing patterns from different sources since 2007. Many firms reported not purchasing from any source since January 2007 (table II-7). Among firms that did report purchasing 100- to 150-seat LCA during this time, most reported fluctuating purchases of U.S. product, or a variety of changes for EU product.

[59] "Fleet complexity has direct and indirect effects on aircraft manufacturers. Aircraft manufacturers have found it easier to compete against one another for an airline's business if the airline owns various models of airplanes made by multiple aircraft manufacturers. Aircraft manufacturers typically work closely with launch customers to create an airplane that meets customer requirements. This has frequently led to bidding wars among major aircraft makers, which sometimes offer airplanes to launch customers at unrealistically low prices, which then requires the manufacturer to sell many more planes to reach a breakeven point. Conversely, an airline that builds its network around one manufacturer/one type of aircraft creates a network effect that results in 'lock-in.' A low-cost carrier with a network based on one aircraft model has little incentive to purchase a comparable airplane from another manufacturer, even if the upfront price of the alternative airliner is attractive." Glennon Harrison, *Challenge to the Boeing-Airbus Duopoly in Civil Aircraft: Issues for Competitiveness*, Congressional Research Service, July 25, 2011, pp. 8-9.

[60] Conference transcript, p. 125 (Nickelsburg), and Boeing's postconference brief, app. 33.

[61] Delta's postconference brief, p. 18.

Table II-7
100- to 150-seat LCA: Changes in purchase patterns from U.S., subject, and nonsubject countries

Source of purchases	Did not purchase	Decreased	Increased	Constant	Fluctuated
United States	4	1	1	1	4
Canada	10	0	0	0	1
European Union	6	2	1	2	0
Other	9	0	0	0	1

Source: Compiled from data submitted in response to Commission questionnaires.

In additional responses, *** reported that it changes its purchasing patterns (including when to purchase and whether to convert aircraft within a contract) based on its fleet needs. *** stated that it ***. *** indicated that it had decreased purchases of U.S. and EU product because demand had switched to larger aircraft with more than 150 seats. *** reported constant purchases of *** *** described ***.

Comparison of U.S.-produced and imported 100- to 150-seat LCA

Importer/purchasers were asked a number of questions comparing 100- to 150-seat LCA produced in the United States, Canada, and the EU. First, purchasers were asked for a country-by-country comparison on the same 22 factors (table II-8) for which they were asked to rate the importance.

Only four importer/purchasers (***) consistently answered the questions comparing U.S. and Canadian 100- to 150-seat LCA. Other

airlines, such as ***, did not answer the question at all. Responding purchasers had mixed responses on the comparability of U.S. and Canadian 100- to 150-seat LCA. A majority indicated that Bombardier product was superior to that of Boeing in availability, cabin comfort, lifecycle costs, maintenance costs, price, and superior technology. A majority also indicated that Boeing product was superior to that of Bombardier in commonality with existing fleet, performance, and range. A majority of responding purchasers rated Boeing and Airbus product as comparable in all factors, while the comparisons of Airbus and Bombardier product were similar to those of Boeing and Bombardier product.

Table II-8
100- to 150-seat LCA: Importer/purchasers' comparisons between U.S.-produced and imported product

Factor	U.S./Boeing vs. Canada/ Bombardier			U.S./Boeing vs. EU/Airbus			Canada/ Bombardier vs. EU/Airbus		
	S	C	I	S	C	I	S	C	I
Availability/backlog	0	2	4	0	7	1	2	3	0
Cabin comfort	1	2	2	0	6	2	2	2	1
Commensurate pricing (i.e., most favored customer agreement)	2	1	1	1	7	0	1	2	1
Commonality with existing fleet	5	0	0	1	7	0	0	1	4
Delivery terms	0	4	0	0	8	0	0	4	0
Emissions requirements	0	3	2	0	8	0	2	3	0
Engine size	1	4	0	0	8	0	0	4	1
Entry-into-service support	1	2	0	0	7	0	0	2	1
Lifetime operating costs (seat and trip)	0	1	3	0	7	0	3	1	0
Maintenance costs	0	1	3	0	8	0	3	1	0
Noise requirements	0	3	2	0	8	0	2	3	0
Payment terms	0	3	0	0	7	0	0	3	0
Performance (landing, take-off, range)	3	2	1	1	7	0	1	3	2
Price[1]	0	1	3	1	7	0	3	1	0
Range greater than 2900 nautical miles	3	2	0	1	7	0	0	3	2
Reduced fuel requirements	0	2	3	0	8	0	3	2	0
Residual value guarantees	0	2	0	0	6	0	0	2	0
Seat capacity	2	1	1	0	8	0	1	1	2
Spare parts	3	2	0	0	8	0	0	2	3
Superior technology	0	2	3	0	8	0	2	3	0
Trade-in commitments	1	2	0	0	7	0	0	2	1
Training support	1	3	0	0	8	0	0	3	1

[1] A rating of superior means that price is generally lower. For example, if a firm reported "U.S. superior," it meant that the U.S. product was generally priced lower than the imported product.

Note.--S=first listed country's product is superior; C=both countries' products are comparable; I=first list country's product is inferior.

Source: Compiled from data submitted in response to Commission questionnaires.

In order to determine whether U.S.-produced 100- to 150-seat LCA can generally be used in the same applications as imports from Canada, the European Union, and other nonsubject countries, firms were asked whether the products can always, frequently, sometimes, or never be used interchangeably. As shown in table II-9, *** and some importer/purchasers reported that 100- to 150-seat LCA from the United States is "always" interchangeable with 100- to 150-seat LCA from Canada, the European Union, and other

nonsubject sources. However, importer/purchasers and *** generally reported that such aircraft were less frequently interchangeable.

Table II-9
100- to 150-seat LCA: Interchangeability between 100- to 150-seat LCA produced in the United States and in other countries, by country pair

Country pair	Boeing				Number of U.S. importer/purchasers reporting				Bombardier			
	A	F	S	N	A	F	S	N	A	F	S	N
U.S. vs. subject countries: U.S. vs. Canada	***	***	***	***	3	1	3	1	***	***	***	***
Nonsubject countries comparisons: U.S. vs. European Union	***	***	***	***	4	1	2	1	***	***	***	***
U.S. vs. other nonsubject	***	***	***	***	1	1	1	1	***	***	***	***
Canada vs. European Union	***	***	***	***	3	1	3	1	***	***	***	***
Canada vs. other nonsubject	***	***	***	***	1	2	0	1	***	***	***	***
European Union vs. other nonsubject	***	***	***	***	1	1	1	1	***	***	***	***

Note.--The question specified that "U.S." meant the Boeing 700 or 737 MAX 7, "Canada" meant the Bombardier CS100 or CS300, and "European Union" meant the Airbus 319. Responses of *** were not included in the table. ***. This table includes the responses of ***.

Note.--A=Always, F=Frequently, S=Sometimes, N=Never.

Source: Compiled from data submitted in response to Commission questionnaires.

In additional comments, *** stated that while the Embraer E190 and E195 models are out of scope according to the definitions outlined in these investigations, they are substitutable with Bombardier's CS100.[62] *** elaborated that while Boeing's 737-700 aircraft are useful in certain unique mission profiles, such as routes requiring take-offs on short runways or at high elevation airports, it is an uneconomical alternative to the Airbus A319 or

[62] ***.

Bombardier CS300 due to its comparatively poorer fuel efficiency and heavier weight.[63] *** cited different crews, runway length requirements, maintenance requirements, seat capacities, and range as factors that limited interchangeability.

Bombardier elaborated that ***, due to the following factors: ***. Bombardier also stated that ***.[64]

Firms were also asked to assess how often differences other than price were significant in sales of 100- to 150-seat LCA from the United States, Canada, the European Union, or other nonsubject countries. As seen in table II-10, *** reported that factors other than price are *** significant when comparing 100- to 150-seat LCA from all sources, while *** reported that they "sometimes" were significant for all country comparisons. Among importer/purchasers, either a majority of firms reported that factors other than price were "always" or "frequently" significant in all comparisons except for Canadian product compared to other nonsubject-country product, in which a plurality reported that they were "sometimes" significant. No firm reported that factors other than price were "never" significant.

[63] *** added that Boeing's new 737 MAX 7 aircraft may eventually provide an additional alternative, but that it is not scheduled to be available until at least 2019.

[64] In its questionnaire response, *** provided similar observations.

Table II-10
100- to 150-seat LCA: Significance of differences other than price between 100- to 150-seat LCA produced in the United States and in other countries, by country pair

Country pair	Boeing				Number of U.S. importer/purchasers reporting				Bombardier			
	A	F	S	N	A	F	S	N	A	F	S	N
U.S. vs. subject countries:												
U.S. vs. Canada	***	***	***	***	3	2	0	0	***	***	***	***
Nonsubject countries comparisons:												
U.S. vs. European Union	***	***	***	***	2	2	1	0	***	***	***	***
U.S. vs. other nonsubject	***	***	***	***	2	1	0	0	***	***	***	***
Canada vs. European Union	***	***	***	***	3	2	1	0	***	***	***	***
Canada vs. other nonsubject	***	***	***	***	1	1	2	0	***	***	***	***
European Union vs. other nonsubject	***	***	***	***	2	1	1	0	***	***	***	***

Note.--The question specified that "U.S." meant the Boeing 700 or 737 MAX 7, "Canada" meant the Bombardier CS100 or CS300, and "European Union" meant the Airbus 319. Responses of *** were not included in the table. ***. This table includes the responses of ***.

Note.--A=Always, F=Frequently, S=Sometimes, N=Never.

Source: Compiled from data submitted in response to Commission questionnaires.

In describing the significance of factors other than price, *** stated that factors other than price (such as fuel efficiency) are typically monetized in a customer's evaluation of the net present value (NPV) of producers' competing bids, and that this provides parties with a well-understood framework for using price discounts to improve the attractiveness of bids. *** stated that ***, it sees the following non-price factors as being important in the 100- to 150-seat LCA market: ***

***.

Bombardier stated that ***.[65]

Among responding importer/purchasers, three identified fuel burn/fuel efficiency as an important non-price factor, two identified delivery schedule/availability, two identified maintenance costs, and one firm each identified the following other non-price factors: delivery time, operating history, crew costs, fleet commonality, considerations for new interiors (such as larger bins and wider seats), and expected total cost of ownership. *** stated that Boeing and Airbus have superior technical support compared to Bombardier. *** stated that the economics of an aircraft is based on maintenance costs, fuel efficiency, and purchase price.

ELASTICITY ESTIMATES

This section discusses elasticity estimates; parties are encouraged to comment on these estimates and should do so as an attachment to their prehearing or posthearing brief.

[65] In its questionnaire response, *** provided similar observations.

U.S. supply elasticity

The domestic supply elasticity[66] for 100- to 150-seat LCA measures the sensitivity of the quantity supplied by U.S. producers to changes in the U.S. market price of 100- to 150-seat LCA. The elasticity of domestic supply depends on several factors including the level of excess capacity, the ease with which producers can alter capacity, producers' ability to shift to production of other products, the existence of inventories, and the availability of alternate markets for U.S.-produced 100- to 150-seat LCA. Analysis of these factors above indicates that the U.S. industry has a moderate ability to increase or decrease shipments to the U.S. market in the longer-term; an estimate in the range of 3 to 6 is suggested. (In the short run, aircraft production is much less elastic; see "U.S. supply" above).

U.S. demand elasticity

The U.S. demand elasticity for 100- to 150-seat LCA measures the sensitivity of the overall quantity demanded to a change in the U.S. market price of 100- TO 150-seat LCA. This estimate depends on factors discussed above such as the existence, availability, and commercial viability of substitute products, as well as the component share of the 100- to 150-seat LCA in the production of any downstream products. Based on the available information, the aggregate demand for 100- to 150-seat LCA is likely to be moderately inelastic to moderately elastic; a range of -0.75 to -1.0 is suggested.

[66] A supply function is not defined in the case of a non-competitive market.

Substitution elasticity

The elasticity of substitution depends upon the extent of product differentiation between the domestic and imported products.[67] Product differentiation, in turn, depends upon such factors as quality (e.g., chemistry, appearance, etc.) and conditions of sale (e.g., availability, sales terms/ discounts/ promotions, etc.). Based on available information, the elasticity of substitution between U.S.-produced 100- to 150-seat LCA and imported 100- to 150-seat LCA is likely to be in the range of 3 to 5.

[67] The substitution elasticity measures the responsiveness of the relative U.S. consumption levels of the subject imports and the domestic like products to changes in their relative prices. This reflects how easily purchasers switch from the U.S. product to the subject products (or vice versa) when prices change.

PART III: U.S. PRODUCERS' PRODUCTION, SHIPMENTS, AND EMPLOYMENT

The Commission analyzes a number of factors in making injury determinations (see 19 U.S.C. §§ 1677(7)(B) and 1677(7)(C)). Information on the subsidies and dumping margins was presented in *Part I* of this report and information on the volume and pricing of imports of the subject merchandise is presented in *Part IV* and *Part V*. Information on the other factors specified is presented in this section and/or *Part VI* and (except as noted) is based on the questionnaire responses of one firm, Boeing, that accounted for all U.S. production of 100- to 150-seat LCA during 2016.[1] [2]

U.S. OPERATIONS

The Commission issued a U.S. producer questionnaire to two firms, Airbus Americas and Boeing based on information contained in the petition and other available industry resources. Boeing provided usable data on its productive operations on 100- to 150-seat LCA. Staff believes that this response represents all U.S. production of 100- to 150-seat LCA. Although they have not yet produced 100- to 150-seat LCA in the United States, Airbus Americas, as well as, CSALP submitted U.S. producers' questionnaire responses with data

[1] Airbus Americas has ***. As of the date of this report, Airbus Americas has ***. Airbus Americas' U.S. producers' questionnaire response, II-7, V-2a, and V-2b.

[2] CSALP submitted a U.S. producers' questionnaire response, which accounts for planned production of the Bombardier C Series aircraft at Airbus Americas' Alabama production facility. Press Release, *Airbus and Bombardier Announce C Series Partnership*, Retrieved November 24, 2017 at http://www.airbus.com/newsroom/press-releases/en/2017/10/airbus-bombardier-cseries-agreement.html

regarding planned production of 100- to 150-seat LCA and/or current production of other single aisle LCA in the United States.

Table III-1 lists Airbus Americas', Boeing's, and CSAPL's, production locations, positions on the petition, and shares of reported production in 2016.

Table III-1
100- to 150-seat LCA: Airbus Americas', Boeing's, and CSAPL's, production locations, positions on the petition, and shares of reported production, 2016

Firm	Position on petition	Production location(s)	Share of production (percent)
Airbus Americas	***	Mobile, AL	---
Boeing	Support	Renton, WA Seattle, WA Landon, SC Auburn, WA Salt Lake City, UT Gresham, WA Helena, MT Everett, WA Puyallup, WA Tukwila, WA	100.0
CSALP	***	Mobile, AL	---
Total			100.0

Note.—Airbus Americas and CSALP ***.

Source: Compiled from data submitted in response to Commission questionnaires.

Production-related activities

As noted above, Boeing is the only firm that currently produces 100- to 150-seat LCA in the United States. However, pursuant to the recently announced planned partnership between Airbus and Bombardier, the Commission requested information through its questionnaires regarding U.S. production plans for CS 100 and CS 300 models, based on the following factors: (1) source and extent of the firm's capital investment; (2) technical expertise involved in U.S. production activities; (3) value added to the product in the United States; (4) employment levels; (5) quantity and type of parts sourced in the United States; and (6) any other costs and activities in the United States directly leading to production of the like product. CSALP's responses are presented in the following tabulation.

Factor	**CSALP's Response**
Describe your plans to produce CS 100 and/or CS 300 models of 100- to 150-seat LCA in the United States, including the timing	***.
Source and extent of firm's capital and investment	***.

Tabulation continued on next page.

Factor	CSALP's Response
Technical expertise involved in U.S. production activity	***.
Value added to the product in the United States	***.
Employment levels	***
Quantity and type of inputs sourced in the United States	***.
Any other costs and activities in the United States directly leading to the production CS 100 and/or CS 300 models of 100- to 150-seat LCA	***.

Source: Compiled from data submitted in response to Commission questionnaires.

RELATED FIRMS

Airbus Americas is owned by Airbus SAS ("Airbus"), a producer of 100- to 150-seat LCA headquartered in France. Boeing is the parent company of ***. CSALP is a limited partnership between Airbus and Bombardier, in which Airbus has a majority stake. The stated purpose of CSALP is to assemble Bombardier's C series aircraft at Bombardier's plant in Quebec and Airbus Americas' plant in Alabama, with the added benefit of cost savings by "leveraging Airbus' supply chain expertise."[3]

Table III-2
100- to 150-seat LCA: U.S. operations ownership, related and/or affiliated firms

Firm	Firm name	Affiliated/ownership
Ownership:		
Airbus Americas	Airbus SAS (France)	100 percent ownership
Boeing	Boeing	Publically traded on NYSE: BA
CSALP	Airbus SAS (France)	50.01 percent ownership
	Bombardier	31 percent ownership
	Investissement Québec (IQ)	19 percent ownership
Related producers:		
Airbus Americas	Airbus SAS (France)	Parent company
CSALP	Airbus Americas	Sister company
Related importer/purchasers:		
***	***	***

Source: Compiled from data submitted in response to Commission questionnaires and Press Release, *Airbus and Bombardier Announce C Series Partnership*, retrieved November 24, 2017 at http://www.airbus.com/newsroom/press-releases/en/2017/10/airbus-bombardier-cseries-agreement.html

[3] The agreement was signed by parties on October 16, 2017 and approved by Boards of Directors of Airbus and Bombardier, as well as, the Cabinet of the Government of Quebec. The agreement remains subject to "regulatory approvals, as well as other conditions usual in this type of transaction", but is currently expected to be completed in the second half of 2018. Press Release, *Airbus and Bombardier Announce C Series Partnership*, Retrieved November 24, 2017 at http://www.airbus.com/newsroom/press-releases/en/2017/10/airbus-bombardier-cseries-agreement.html

Changes in operations

Table III-3 presents reported changes in Airbus Americas and Boeing operations since January 1, 2014.

Table III-3
100- to 150-seat LCA: Reported changes in Airbus Americas and Boeing operations, since January 1, 2014

* * * * * * *

U.S. PRODUCTION, CAPACITY, AND CAPACITY UTILIZATION

100- to 150-seat LCA

Table III-4 and figure III-1 present Boeing's production, capacity, and capacity utilization. Boeing's aggregate capacity and production decreased from *** units in 2014 to *** units in 2015 and 2016, and decreased to *** units in January – September 2017 compared to *** in January-September 2016. Boeing explained that ***.[4] Capacity utilization remained at *** percent throughout from 2014 through September 2017.

Table III-4
100- to 150-seat LCA: Boeing's capacity, production, and capacity utilization, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

[4] Boeing also explained that capacity utilization is based on existing orders and at no point is there excess capacity. Capacity, according to Boeing, is linked to the manufacturer's ability to win orders. Conference transcript, p. 118 (Anderson).

Figure III-1
100- to 150-seat LCA: Boeing's capacity, production, and capacity utilization, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Alternative products

Table III-5 presents Airbus Americas' and Boeing's production of aircraft in the United States regardless of whether using shared machinery. 100- to 150-seat LCA accounted for *** percent of total number of aircraft produced during 2016. Production of larger aircraft (other single aisle LCA and all other LCA) accounted for *** percent of total aircraft production during 2016. Other single aisle LCA production since 2014 consisted of ***, as well as, ***. The all other LCA category (double-aisle aircraft) production consisted of ***.[5]

[5] Boeing noted that double-aisle LCA are produced in a separate facility located in Everett, Washington. Conference transcript, p. 61 (Conner).

Airbus Americas and Boeing were asked about their ability to switch production between products. Boeing notes that ***. Airbus Americas reported that ***.

Airbus Americas and Boeing were also asked to describe the constraint(s) that set the limit(s) of their production capacity. Boeing explains that ***.

Table III-5
All aircraft: Airbus Americas' and Boeing's production of aircraft in the United States regardless of whether using shared machinery, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Table III-6 presents Boeing's fixed assets[6] dedicated to production of 100- to 150-seat LCA and those assets that can be economically repurposed for production of other aircraft.

Table III-6
100- to 150-seat LCA: Boeing's fixed assets for 100- to 150-seat LCA production, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

[6] Fixed assets were defined in the questionnaire as tangible objects used in production with a useful life greater than one year.

Table III-7 presents Airbus Americas' and Boeing's projected production whether or not using the same equipment as 100- to 150-seat LCA during 2017-22. U.S. producers reported that the *** of their production *** during 2017-22 but the share of production of 100- to 150-seat LCA will increase to *** percent by 2022. Boeing contends that "{i}n the unlikely event that the 737 MAX 7 manages to remain viable in the face of additional pressure from the C Series, {…there will be} reductions in production and shipments" as well as harm to Boeing's overall operations and finances.[7] Boeing also projected that U.S. airlines will require approximately *** new 100- to 150-seat LCA units delivered by 2028 in order to meet current fleet replacement needs. These orders will most likely be made within the next five years due to the lag times between orders and deliveries, which is typically several years.[8]

[7] Boeing's postconference brief, pp. 48-49.
[8] Boeing's postconference brief, app. A, p. 3.

Table III-7
100- to 150-seat LCA: Airbus Americas' and Boeing's projected production regardless of whether using shared machinery, 2017-22

* * * * * * *

BOEING'S U.S. SHIPMENTS AND EXPORTS

Historical shipments

Table III-8 and figure III-2 present Boeing's historical U.S. shipments of 100- to 150-seat LCA during 2007-16. These data show that the number of Boeing's U.S. shipments decreased from *** units to *** units from 2007 to 2013. As explained further below, U.S. shipments during 2014-16 consisted of ***.

Table III-8
100- to 150-seat LCA: Boeing's historical U.S. shipments, 2007-16

* * * * * * *

Boeing explained the trend in its shipments from 2007 to 2013. ***.[9]

[9] ***. Delta noted that Boeing could not offer Delta new aircraft in the 100- to 110-seat space that met its needs in the required timeframe, which is why it purchased the aircraft from Bombardier. Conference transcript, pp. 176-177 (May); Boeing, however, contends that it did not offer new 737-700 or 737 MAX 7 models because ***. Boeing's postconference brief, p. 20, n.94.

Figure III-2
100- to 150-seat LCA: Boeing's historical U.S. shipments, 2007-16

* * * * * * *

Current shipments

Table III-9 presents Boeing's U.S. shipments, export shipments, and total shipments of 100- to 150-seat LCA. Boeing's reported U.S. shipments of 100- to 150-seat LCA consisted *** from 2014 to September 2017. Boeing also reported ***. Boeing's total shipments of 100- to 150-seat LCA decreased by *** percent from 2014 to 2016, and were *** percent lower in January–September 2017 than in January–September 2016. The value of Boeing's total shipments also decreased by *** percent from 2014 to 2016 and was *** percent lower in January–September 2017 than in January–September 2016. The average unit value of Boeings total shipments of 100- to 150-seat LCA fluctuated, however, increasing by *** percent from 2014 to 2015, but decreasing by ***

percent from 2015 to 2016 and was *** percent lower in January–September 2017 than in January–September 2016.[10]

Export shipments of 100- to 150-seat LCA accounted for *** of total shipments during 2014-September 2017. Boeing explained that ***.[11] In addition, Boeing reported that ***.[12]

[10] During 2007-16, Boeing's commercial shipments accounted for *** percent of total shipments.
[11] ***.
[12] Ibid.

Table III-9
100- to 150-seat LCA: Boeing's U.S. shipments, export shipments, and total shipments, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Backlog

Table III-10 presents Boeing's historical orders, beginning of period backlog, and total order book of 100- to 150-seat LCA, by customer type. Boeing's reported total end-of-period backlog of orders of 100- to 150-seat LCA from all customers ranged from *** to *** units on various dates between December 31, 2014 and September 30, 2017 (table III-11).[13] Boeing also indicated that ***.[14] The decrease in backlog from 2015 to 2016 was attributable to a ***.[15]

[13] These total backlog amounts include ***. ***.

[14] ***.

[15] In the first quarter of 2016, ***. Boeing's U.S. producers' questionnaire response to question IV-17 of the U.S. producers' questionnaire.

Table III-10

100- to 150-seat LCA: Boeing's historical orders, beginning of period backlog, and total order book, by customer type, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Table III-11
100- to 150-seat LCA: Boeing's end-of-period backlog, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Sales efforts

The U.S. producers' questionnaire asked firms to report on recent, current, and likely future 100- to 150-seat LCA sales efforts concerning U.S. customers during 2014-22. Boeing reported the following sales efforts:[16]

***: ***.

[16] Airbus Americas reported that ***. CSALP did not provide a response to this question.

***. ***.

***. ***.

***. ***

***.

***: ***.

***: ***.

***: ***.

***: ***

***.

***: ***.

***: ***.

U.S PRODUCER'S ORDERS

The Commission received information regarding orders of 100- to 150-seat LCA from Boeing. Airbus Americas reported ***, and indicated that ***.

Boeing contends that orders determine capacity and production in the aircraft manufacturing industry, as firms do not manufacture aircraft to create inventory.[17] Orders are also important to the development of a new line of aircraft, as they serve as a sign of product

[17] Conference transcript, pp. 21 (Novick), 118 (Anderson), and 119-120 (Conner).

viability to potential customers, and because they are a source of advance payments that can partially fund the development of new aircraft. In particular, "winning orders during the design and development phase is generally necessary to prevent premature program termination."[18] Boeing further explained that orders also enable firms to navigate learning curves relatively quickly during the production of new aircraft.[19] Due to the limited number of major orders, Boeing contends that the loss of one order may have a negative impact on the firm's commercial momentum.[20]

Order details

Boeing had orders for a total of seven 737-700 and 737-700C model aircraft from January 2014 to October 2017. Most of the identified customers for these aircraft are foreign entities: China Development Bank Financial Leasing Co. (three 737-700 model aircraft), Kunming Airlines (two 737-700 model aircraft), and Air Algerie (two 737-700C model aircraft). Additionally, The United States Navy ordered two 737-700C model aircraft and unidentified customers ordered two 737-700 model aircraft. Boeing also reports that it currently has unfilled orders for four 737-700 and 737-700C model aircraft.[21]

Regarding its current U.S. orders for the 100- to 150-seat LCA, Boeing indicated that ***

[18] Ibid., pp. 36-37 (Nickelsburg).
[19] Ibid., p. 92 (Anderson).
[20] Ibid., p. 28 (Conner).
[21] Boeing, "Orders & Deliveries," database, http://www.boeing.com/commercial/#/orders-deliveries (accessed November 17, 2017).

***. Boeing reported *** orders of 100- to 150-seat LCA for delivery during 2017-18.[22]

Overall, Boeing reports that it has received ***.

Order pricing

Based on the data provided by Boeing on its U.S. orders for 100- to 150-seat LCA aircraft, the price of an individual aircraft is between $***. The price of Boeing's *** current unfulfilled orders for these aircraft includes a number of ancillary items—these include ***.[23]

Boeing reported that ***

[22] Boeing's data on its current orders ***. ***.

[23] Ancillary items account for *** of the total cost of the company's future 737 MAX 7 orders.

***.

Order delivery

Boeing reported that the average length of time between orders and deliveries is ***.

Boeing ***.

Order risk and cancellation

Boeing reported that ***.

BOEING'S INVENTORIES

U.S. producers were asked to report end-of-period inventories of 100- to 150-seat LCA (table III-12). Boeing reported *** in its end-of-period inventories throughout 2014–September 2017. Boeing reported, with respect to inventories, that it ***.

Table III-12
100- to 150-seat LCA: Boeing's inventories, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

BOEING'S IMPORTS AND PURCHASES

U.S. importer/purchaser Boeing Capital Corporation ("Boeing Capital") ***.[24] Since 2014, Boeing Capital purchased *** used/refurbished 100- to 150-seat LCA units from Boeing at a value of approximately $***.

[24] ***.

U.S. EMPLOYMENT, WAGES, AND PRODUCTIVITY

Boeing produces 100- to 150-seat LCA in Renton, Washington.[25] Table III-13 presents Boeing's employment-related data. Boeing's employment measured by production and related workers ("PRW") decreased by *** percent from 2014 to 2015, but increased by *** percent from 2015 to 2016. Boeing's employment measured by PRWs decreased by *** percent overall from 2014 to 2016.[26] Boeing's total hours worked decreased by *** percent from 2014 to 2015, but increased by *** percent from 2015 to 2016. Boeing's total hours worked decreased overall by *** percent from 2014 to 2016. In addition, Boeing's hourly wages increased by *** percent from 2014 to 2016. Boeing noted that ***. Furthermore, unit labor costs increased by *** percent from 2014 to 2016, and productivity decreased by *** percent from 2014 to 2016.

[25] Conference transcript, pp. 59-60 (Conner).

[26] Boeing further noted that it cross-trains employees to maintain a learning curve, enabling them to work on various LCA models. Ibid., p. 149 (Conner).

Table III-13
100- to 150-seat LCA: Boeing's average number of production and related workers, hours worked, wages paid to such employees, hourly wages, productivity, and unit labor costs, 2014-16 January to September 2016, and January to September 2017

* * * * * * *

Table III-14 presents estimated value-added by production activities in the United States by Boeing, as well as a projection of value-added activities by CSALP. Boeing reported that, ***.

Table III-14
100- to 150-seat LCA: Boeing and CSALP's estimated U.S. value-added

Item	Estimated value-added	
	Boeing 2016	Bombardier / CSALP[1]
U.S. valued added	***	***
Foreign value added	***	***
Total value	100.0	100.0

[1] Bombardier based on this ***.

Source: Compiled from data submitted in response to Commission questionnaires.

PART IV: U.S. IMPORTS, APPARENT U.S. CONSUMPTION, AND MARKET SHARES

U.S. IMPORTER/PURCHASERS

The Commission issued U.S. importer/purchaser' questionnaires to 39 firms believed to be importer/purchasers of 100- to 150-seat LCA, as well as to U.S. producers of 100- to 150-seat LCA.[1] Usable questionnaire responses were received from 13 companies, representing *** U.S. purchases and sales for importation from Canada and Europe from January 1, 2014 through September 30, 2017 under HTS subheading 8802.40.00.[2] Table IV-1 lists all responding U.S. importer/purchasers of 100- to 150-seat LCA, their locations, and their shares of U.S. imports and purchases, by quantity, in 2016.

[1] The Commission issued questionnaires to those firms identified in the petition, along with firms that, based on a review of data provided by ***, may have accounted for more than one percent of total imports under HTS subheading 8802.40.00 since 2010. The following firms provided a U.S. importer/purchasers' response that certified they have not imported, ordered, accepted delivery of, received offers for sale for, and/or entered into a lease arrangement for 100- to 150-seat LCA or other single aisle LCA from any country since 2007: ***.

[2] Since HTS subheading 8802.40.00 is a broad category for passenger aircraft that includes a substantial amount of out-of-scope items, import data presented in the report are based on data compiled from completed questionnaire responses.

Table IV-1
100- to 150-seat LCA: U.S. importer/purchasers by source, 2016

Firm	Headquarters	Share of imports and/or purchases by source (percent)				
		Boeing / United States	Bombardier / Canada	Airbus / European Union	All import sources	Total purchases and imports
Air Lease	Los Angeles, CA	***	***	***	***	***
Alaska	Seattle, WA	***	***	***	***	***
American	Ft. Worth, TX	***	***	***	***	***
Aviation Capital	Newport Beach, CA	***	***	***	***	***
BBAM	San Francisco, CA	***	***	***	***	***
Boeing Capital	Renton, WA	***	***	***	***	***
BofA	Charlotte, NC	***	***	***	***	***
Delta	Atlanta, GA	***	***	***	***	***
GECAS	Norwalk, CT	***	***	***	***	***
JetBlue	Long Island City, NY	***	***	***	***	***
Southwest	Dallas, TX	***	***	***	***	***
United	Chicago, IL	***	***	***	***	***
Virgin	Burlingame, CA	***	***	***	***	***
Total		100.0	***	100.0	100.0	100.0

Note.--These data include imports/purchases of both new and used/refurbished aircraft.

Source: Compiled from data submitted in response to Commission questionnaires.

Air Lease

Air Lease *** (table IV-2). Air Lease plans to ***. Air Lease reported that ***.

Table IV-2
Single aisle civilian aircraft, including 100- to 150-seat LCA: Air Lease's business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Alaska

Alaska *** (table IV-3).

Table IV-3
Single aisle civilian aircraft, including 100- to 150-seat LCA: Alaska's business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

American

American *** (table IV-4). While American *** in 2015, the majority of American's fleet of ***. American noted that ***.[3]

Table IV-4
Single aisle civilian aircraft, including 100- to 150-seat LCA: American's business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

[3] American ***.

Aviation Capital Group ("ACG")

ACG's *** (table IV-5). ACG has a ***. It ***.

Table IV-5
Single aisle civilian aircraft, including 100- to 150-seat LCA: ACG's business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

BBAM

BBAM's *** (table IV-6). As a ***.[4]

Table IV-6
Single aisle civilian aircraft, including 100- to 150-seat LCA: BBAM's business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

[4] ***.

Boeing Capital

Boeing Capital *** (table IV-7). Boeing Capital ***.[5] Boeing Capital noted that ***.

Table IV-7
Single aisle civilian aircraft, including 100- to 150-seat LCA: Boeing Capital's business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

[5] Boeing Capital ***.

BofA

BofA *** (table IV-8). BofA ***.

Table IV-8
Single aisle civilian aircraft, including 100- to 150-seat LCA: BofA's business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Delta

Delta *** (table IV-9). ***.[6] These ***.[7] Delta noted that ***. In addition, Delta explained that the ***.

Delta further explained that it maintains a diverse aircraft fleet of various sizes from every major manufacturer to enable it to match its aircraft to its specific mission profile. Delta is also currently executing a fleet optimization strategy to reduce operating costs and improve product quality by shifting from small regional jets to increasingly larger mainline aircraft, including both subject 100- to 150-seat LCA and other single aisle LCA, which are most cost-efficient on a per-seat basis.[8] In addition, Delta noted that it looks at its "mission per seat cost

[6] Delta ***. Delta expects that ***.
[7] Delta's U.S. importer/purchasers' questionnaire response, attachment.
[8] Delta's postconference brief, pp. 18, 22.

{and} revenue projections to evaluate the financial merit of any potential acquisition in combination with {its…} own experience in negotiating with suppliers."[9]

Table IV-9
Single aisle civilian aircraft, including 100- to 150-seat LCA: Delta's business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

GECAS

GECAS ***(table IV-10). ***.

[9] Conference transcript, p. 179 (May).

GECAS ***.[10]

Table IV-10
Single aisle civilian aircraft, including 100- to 150-seat LCA: GECAS' business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

[10] GECAS explained that ***. ***.

JetBlue

JetBlue *** (table IV-11). It operates a fleet of ***. JetBlue *** from January 2014 through September 2017, but ***.[11]

Table IV-11
Single aisle civilian aircraft, including 100- to 150-seat LCA: JetBlue's business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

[11] Investigator's phone notes, November 13–November 29, 2017, conversation with ***, November 22, 2017. Value data were estimated by staff using the average purchase price of *** reported by other respondents.

Southwest

Southwest *** (table IV-12). It also *** during 2014 to September 2017. Southwest ***.

Southwest expects to ***. Additionally, ***.

Table IV-12
Single aisle civilian aircraft, including 100- to 150-seat LCA: Southwest's business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

United

United *** (table IV-13). The ***. United explained that ***.

Table IV-13
Single aisle civilian aircraft, including 100- to 150-seat LCA: United's business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Virgin America

Virgin America, which merged with Alaska in 2016,[12] *** (table IV-14).[13] The firm reported ***. It also did ***.

Table IV-14
Single aisle civilian aircraft, including 100- to 150-seat LCA: Virgin America's business model, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

[12] Alaska Air Group Closes Acquisition of Virgin America, Becomes the 5th Largest U.S. Airline, https://newsroom.alaskaair.com/2016-12-14-Alaska-Air-Group-closes-acquisition-of-Virgin-America-becomes-the-5th-largest-U-S-airline, December 14, 2016.

[13] Virgin America ***.

U.S. IMPORTS/PURCHASES

Table IV-15 and figure IV-1 present data for U.S. imports and/or purchases of 100- to 150-seat LCA.[14] These data show that ***,[15] while ***. There were ***.[16] ***.

[14] Import data refer to purchases of new aircraft from manufacturers other than Boeing.

[15] Virgin reported ***.

[16] Boeing noted that purchasing a used airplane can be a more cost-effective solution for a customer if the airplane and refurbishment price prices are appropriate and it still has a long economic life, despite the fact that it may not have as advanced operating performance features and would require higher maintenance costs. Conference transcript, pp. 109, 111 (Conner, Anderson).

Boeing also explained that with the exception of Delta, airlines typically do not look to the used LCA market for their fleet replacement needs since used LCA are not available in sufficient quantities. They will purchase used/refurbished LCA to meet a need for additional capacity in a short timeframe. Delta, however, uses a strategy that involved purchasing used/refurbished LCA and maximizing its in-house maintenance capabilities to extend the useful life of these LCA. Boeing's postconference brief, app. A, pp. 17-18.

Table IV-15
100- to 150-seat LCA: U.S. imports and/or purchases, by source, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Table IV-15--Continued
100- to 150-seat LCA: U.S. imports and/or purchases, by source, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Table IV-15--Continued
100- to 150-seat LCA: U.S. imports and/or purchases, by source, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Figure IV-1
100- to 150-seat LCA: U.S. import quantities and average unit values (new aircraft), 2014-16, January to September 2016, and January to September 2017

* * * * * * *

NEGLIGIBILITY

The statute requires that an investigation be terminated without an injury determination if imports of the subject merchandise are found to be negligible.[17] Negligible imports are generally defined in the Tariff Act of 1930, as amended, as imports from a country of merchandise corresponding to a domestic like product where such imports account for less than 3 percent of the volume of all such merchandise imported into the United States in the most recent 12-month period for which data are available that precedes the filing of the petition or the initiation of the investigation. However, if there are imports of such merchandise from a number of countries subject to investigations initiated on the same day that individually account for less than 3 percent of the total volume of the subject merchandise, and if the imports from those countries collectively account for more than 7 percent of the volume of all such merchandise imported into the United States during the applicable 12-month period, then imports from such countries are deemed not to be negligible.[18] The statute also provides that, even if subject imports are found to be negligible for the purposes of present material injury, they shall not be treated as negligible for purposes of a threat analysis should the Commission determine that there is a potential that subject imports from the country concerned will imminently account for more than 3 percent of all such merchandise imported into the United States.[19]

---

[17] Sections 703(a)(1), 705(b)(1), 733(a)(1), and 735(b)(1) of the Act (19 U.S.C. §§ 1671b(a)(1), 1671d(b)(1), 1673b(a)(1), and 1673d(b)(1)).

[18] Section 771 (24) of the Act (19 U.S.C § 1677(24)).

[19] 19 U.S.C. § 1677(A)(iv).

Imports from Canada accounted for zero percent of total imports of 100- to 150-seat LCA by quantity during 2016 and for the period from April 2016 to March 2017. The petitioner, however, alleges that C Series imports from Canada will be 100 percent of all imports in 2018 and well above 50 percent in each subsequent year through 2021 based on the terms of Delta's order.[20] Table IV-16 presents data regarding projected deliveries of 100- to 150-seat LCA to the United States by Airbus and Bombardier. During the preliminary phase of these investigations, deliveries by Bombardier of 100- to 150-seat LCA were projected to begin April 2018;[21] however, in light of the partnership agreement between Bombardier and Airbus, ***. According to Delta, ***.[22] Bombardier ***.[23]

[20] Petition, p. 28; Boeing's postconference brief, p. 24.
[21] Bombardier's postconference brief, p. 2.
[22] Delta's U.S. importer/purchasers' questionnaire response, II-8 and CSALP's U.S. producers' questionnaire response, II-16 and attachments thereto.
[23] Bombardier's foreign producers' questionnaire response, attached supplement to II-11a .

Table IV-16
Projected 100- to 150-seat LCA deliveries of Airbus and Bombardier, 2017-22

* * * * * * *

APPARENT U.S. CONSUMPTION AND MARKET SHARES

Table IV-17 presents data on apparent U.S. consumption and U.S. market shares for new 100- to 150-seat LCA. These data show that consumption of 100- to 150-seat LCA consists of ***. Apparent U.S. consumption increased by *** from 2014 to 2015, but decreased by *** from 2015 to 2016. In addition, apparent U.S. consumption by quantity was *** higher during January to September 2016 than (***) during January to September 2017.

Table IV-17
100- to 150-seat LCA: Apparent U.S. consumption 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Figure IV-2
100- to 150-seat LCA: Apparent U.S. consumption, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

PART V: PRICING DATA

INPUT COSTS

The main inputs for the production of 100- to 150-seat LCAs are the components that are assembled into an aircraft. Once a purchase order is received, 100- to 150-seat LCA manufacturers work with various component suppliers to develop and produce parts for each aircraft. While some components are used across all 100- to 150-seat LCA, some components can be specifically developed and produced based on purchaser specifications. Overall, Boeing's cost of raw materials, as a percentage of total cost of goods sold, was *** percent over 2014 to 2016.[1]

SALES AND PRICING PRACTICES

100- to 150-LCA prices

According to Boeing, subject imported and domestic 100- to 150-seat LCA are substitutable and ultimately compete for sales on price alone, with non-price factors monetized, and then reflected in the final contract price.[2] Boeing also reported that demand for travel on routes served by 100- to 150-seat LCA is highly price sensitive, which in turn drives airline companies to aggressively seek competitive aircraft pricing.[3]

[1] *See Part VI* for additional information on raw material costs.

[2] Conference transcript, p. 49 (Anderson). For example, after comparing the various ***. Boeing's postconference brief, exh. ER-97.

[3] Petition, p. 49.

Respondents, however, contend that in addition to price, airlines also consider other factors such as fuel burn rates and efficiency, the weight of the aircraft which can drive landing fees and other costs, and maintenance costs as well as factors such as range, passenger comfort, field performance, and noise levels.[4] Respondents conclude that, "numerous ancillary terms, options, and performance guarantees would make it impossible to compare simple price data across contracts on a consistent, apples-to-apples basis."[5] In addition, Respondents stated that high-volume purchases by a customer result in commercial or volume discounts.[6]

In addition to differences in pricing due to non-price factors, Respondents allege that there is a pattern of pricing for new aircraft that are entering into service for the first time. An airline that is among the first to accept the delivery of a new model knows that it faces risks of difficulties and delays given the complexity of aircraft production.[7] According to Respondents, the "launch price" or "marquee deal" (see below) can be anywhere from 20 to 30 percent lower than the price of subsequent sales.[8] Delta added that "one widely recognized and consistent feature {of this industry} is that launch or marquee customers receive favorable pricing that reflect their status and the risk associated with adopting new aircraft."[9] Consequently, in their view, because the launch price compensates for additional risk and the evaluation of a new aircraft, the launch price does not set a price ceiling (or create a "lighthouse effect") for

[4] Conference transcript, p. 165 (Mitchell).
[5] Bombardier's postconference brief, p. 30.
[6] Conference transcript, p. 177 (May).
[7] Ibid., p. 165 (Mitchell).
[8] Ibid., p. 238 (May).
[9] Delta's postconference brief, p. 28.

subsequent sales.[10] In situations where an aircraft is "unproven," smaller airlines give "significant" weight to larger airlines when considering placing an order for a new aircraft type.[11] Respondents add that after an aircraft obtains certification, a steady delivery stream is established, and in-service disruptions diminish, the risks associated with purchasing the aircraft decline and prices tend to rise.[12]

Contracts, sales terms, and discounts

According to Boeing, the key purchase items (see below) are set at the time of order and formalized in contractually binding obligations. Order contracts include initial deposits at time of order, and significant pre-delivery installment payments that support the cash flow needed to sustain production operations.[13]

Both Boeing and Bombardier reported that their sales contracts contain ***. Boeing indicated that it had ***. For its U.S. orders, Bombardier described the ***.

[10] Ibid., pp. 177, 178 (May).
[11] Delta's postconference brief, p. 31.
[12] Ibid., p. 166 (Mitchell).
[13] Petition, pp. 2, 47.

Boeing described its pre-delivery payment as ***.

Bombardier described its pre-delivery schedule as ***.[14]

Boeing indicated that ***

[14] Regarding engine pricing, Boeing indicated that the "***." Bombardier indicated that the "***."

***.

Contracts for 100- to-150 seat LCA may allow importer/purchasers to make some changes to delivery and the models specified. Table V-1 summarizes importer/purchaser descriptions of how often their contracts contain such options, and table V-2 summarizes how often they reported exercising such options. Importer/purchasers were more likely to report sometimes deferring delivery than upgrading to other models. However, five purchasers did describe having contracts with the ability to upgrade models, and sometimes exercising such options.[15] Among major airlines, *** stated that contracts frequently allow deferred delivery and sometimes allow upgrades to other models; *** answered sometimes to both; and *** answered sometimes to each individually, but stated that contracts never allowed both. The two firms describing themselves as frequently exercising options to purchase out-of-scope aircraft were ***.

[15] With regard to deferral specifically, importer/purchasers were asked how often, since January 1, 2007, they had requested deferred deliveries of 100- to 150-seat LCA. For the period 2007 through 2013, no importer/purchaser indicated it had requested such deferrals by a specific amount of time, although *** stated that it had frequently adjusted its order books, for varying periods, to align with demand. For the period since January 1, 2014, *** indicated that it had ***. *** indicated that it had deferred *** aircraft for more than 2 years, based on its aircraft network needs.

Table V-1
100- to 150-seat LCA: U.S. importer/purchasers' reported frequency of contractual options

Item	Number of firms reporting			
	Always	Frequently	Sometimes	Never
Deferred delivery	0	1	6	2
Upgrade to models not originally in contract	0	0	5	4
Deferred delivery and upgrade to models not originally in contract	0	0	4	5

Source: Compiled from data submitted in response to Commission questionnaires.

Table V-2
100- to 150-seat LCA: U.S. importer/purchasers' reported frequency of exercising contractual options

Item	Number of firms reporting			
	Always	Frequently	Sometimes	Never
Option to buy additional scope	0	0	3	6
Option to convert to larger scope model	0	0	1	8
Option to convert to larger out-of-scope model	0	2	3	4

Source: Compiled from data submitted in response to Commission questionnaires.

Both airline and leasing company importer/purchasers that described upgrading or deferring shipments under a purchase contract described doing so because of changing market demands and/or new models introduced. When asked why a buyer may wish to upgrade a model, importer/purchasers described the benefits as keeping the fleet more aligned with demand conditions. Some added that those benefits must be balanced against the cost of any cost escalators in the contract for doing so.

Bidding process

Because of the limited number of global producers and high concentration of purchasers, responding firms described various 100- to 150-seat LCA solicitation and purchase processes ranging from formal request for proposals ("RFP") and bids, to informal discussions or direct negotiations with one or more suppliers, to single sourcing of aircraft. Boeing described the process as primarily centered on the bid process.

According to Boeing, aircraft sales are generally ***. Boeing also stated that, although sales campaigns vary in terms of the formality of the process, ***. Boeing added that ***.

*** described bids as being ***. ***.

Bombardier reported that its sales are conducted ***, as did CSALP. Bombardier stated that ***.

Importer/purchasers described a variety of purchase methods, driven by individual fleet needs and purchase preferences. *** reported that it typically engages in a bidding process (but for additional aircraft purchases for the existing 737 fleet, it will ***; whereas *** indicated that it generally does not issue an RFP, preferring to work with identified manufacturers when there is an identified need. *** negotiate and enter into agreements directly with Boeing (***) and Airbus (***). *** negotiates directly with manufacturers for new aircraft, but solicits bids for used aircraft. *** reported that it uses no single standard method, elaborating that its recent purchase agreement with ***.[16] Among other importer/purchasers, ***

[16] ***.

*** requests formal proposals, *** negotiates directly with suppliers, and ***.

Four importer/purchasers (***) described bids as closed, while two (***) indicated that they were open. *** also indicated that in closed bids, bidders typically knew the identities of the other bidders.[17]

Four importer/purchasers (***) indicated that in the negotiating process, they discussed competing bids or solicitations in order to obtain lower prices. *** stated that they did not share the specifics of competitors' bids, but do let bidders know when their bids are not competitive. *** stated that it did let competitors know how much they lagged other bidders. Four other importer/purchasers (***) indicated that they did not discuss competing bids.

U.S. importer/purchasers indicated that they consider a number of factors during the bid process, including price and non-price factors. Identified factors include various economic and technical factors such as purchase price, overall operating cost, seat cost efficiency, availability/delivery timing, performance, warranties, and finance terms. *** reported that there are many iterations in its bid process, and that price is only one of many factors considered.

[17] No other importer/purchasers answered the question.

In terms of frequency of solicitation and years of deliveries covered by purchases, importer/purchasers generally did not report specific approaches or requirements. Most indicated that they purchase infrequently, having no specific pattern, or as needed, and that overall purchase timing and delivery schedule depends on fleet plan, size of order, and aircraft needs. Airline importer/purchasers generally indicated that deliveries under a purchase can extend for two to seven years. *** elaborated that in its ***.

Impacts of bids or purchase price offers

Producers and importer/purchasers were asked how the outcome of bids or purchase price offers in the 100- to 150-seat LCA industry influence their subsequent bids or price offers to other purchasers. Boeing stated that ***. Bombardier stated that ***. ***.

Among importer/purchasers, *** stated that on multi-offer bids, the winning bid usually contains ***. *** stated that it tries to ***. *** also noted similar reasons for preferring to stay with the same supplier, but added that it ***. Leasing firm *** stated that ***. *** stated that ***.

Impact of sales performance

Firms were asked how recent market sales performance of a given 100- to 150-seat LCA model affects the likelihood that a purchaser will order that model in the future. Boeing stated that ***.

Bombardier and CSALP described ***.

Among importer/purchasers, several responding firms indicated that past sales performance does not play a large role in their purchases of 100- to 150-seat LCA. Three ***, along with ***, stated that past sales performance of a particular model plays little or no role in their likelihood to order that model. *** stated that purchases are determined by ***. *** stated that it pursues a strategy of ***. *** stated that it looks at ***. On the other hand, *** stated that it takes ***. *** stated that it ***

***..

Firms excluded from bids

Firms were asked to describe any instances of being excluded from bidding, or purchaser solicitations, on U.S. sales of 100- to 150-seat LCA. Boeing ***

***.

Bombardier ***.

Trends in bid and sales prices

Firms were asked about trends in bid or sales prices since January 1, 2014. Boeing indicated that ***. On the other hand, ***.

Among importer/purchasers, *** described the trend in prices since 2014 ***

***. *** stated that it sees variation in the prices of 100- to 150-seat LCAs depending on conditions in the wider economy. *** stated that it ***. *** stated that when demand is higher for a particular type of aircraft, delivery times become longer.

Launch and marquee sales

Launch sales are sales of new models of large civil aircraft. Producers and importer/purchasers were asked what kind of discount from average list price is received by launch customers. Boeing stated that ***. Boeing added that ***.

Bombardier and CSALP ***

***.

Eight importer/purchasers expressed familiarity with launch sales, while three indicated that they were not familiar. Importer/purchasers described a wide range (from 5 to 50 percent) for the discounts off list price that launch sales may command, but *** clarified that while all customers may receive a *** percent discount for routine sales, there is an additional *** percent discount for launch sales. Similarly, *** stated that the ***. Importer/purchasers generally did not distinguish between derivative and clean sheet LCA models in describing launch sale discounts, with *** adding that while there is no consistent difference between derivative-model and clean-sheet-model launch sale discounts, it would expect a slightly higher discount on models that were not yet accepted in the market. *** stated that it did not think there was any "typical" discount due to high levels of variation from sale to sale.

Importer/purchasers were asked how launch prices affect their expectations for similar LCA. *** described later sales discounts as similar to those for launch sales discounts. *** stated that when a manufacturer has launched a new model to compete against a competitor's existing model, it would expect a discount on the new model. *** similarly stated that it expected competitive discounts on later sales. *** stated that "what affects price" is competition among suppliers for a sale. With regard to derivative models in

particular, *** stated that it expected the best pricing on launch sales, and *** stated that discounts are usually not maintained on later sales.

Importer/purchasers were also asked about how the announced launch of derivative models of 100- to 150-seat LCAs affects the prices of other 100- to 150-seat LCAs from the same manufacturer. Five answered that it would likely, or at least could, reduce prices, citing the perception that such sales would mean older models are being replaced with a newer, more technologically advanced one. However, *** did not expect any reduction, and *** stated that an effect would be unclear, since it described Airbus and Boeing as "really" only having one model each in the 100- to 150-seat LCA market. Five importer/purchasers expected that a new model of 100- to 150-seat LCA would decrease the price that they would be willing to pay for current models, while three (***) did not anticipate a change. *** stated that its answer depended on the technology in the two models remaining the same. *** stated that price depends on competition.

"Marquee sales" are sales of large civil aircraft to prominent purchasers. Firms were asked to identify the discount from average list price received by marquee customers. Boeing stated that ***. Boeing also

added that ***.

Bombardier and CSALP ***.

Seven importer/purchasers expressed familiarity with marquee sales, while two indicated that they were not familiar with such sales. Similar to its response for launch sales, *** stated that ***. *** stated that it expects discounts of *** percent off of the list price for marquee sales. *** stated that marquee discounts exist both because ***. *** stated that it did not think there was any "typical" discount due to high levels of variation from sale to sale. (No importer/purchaser responded differently for clean sheet models than for derivative models, other than to indicate that they had only purchased derivative models).

Importer/purchasers did not provide extensive answers when asked how marquee prices affect their purchase prices for similar LCA. *** stated that it ***. *** stated that "what affects price" is competition among suppliers for a sale. *** stated that it would expect deeper discounts on new models with untested features than on derivative models.

Bundled purchases

Importer/purchasers were asked if they simultaneously negotiate with a single manufacturer for the purchase of 100- to 150-seat LCA along with other aircraft. Seven stated that they did not, while five (***) stated that they did. Four of those five stated that the price negotiated for the 100- to 150-seat LCA is contingent on the prices of the other aircraft, while *** stated that it was not. *** described bundled purchases as affecting prices for 100- to 150-seat LCA "from time to time." *** stated that it typically negotiated ***. *** also indicated that it negotiates for such ***. ***.

Conversions

Some contracts allow purchasers to convert their orders of one type of aircraft to another, that is, from a 100- to 150-seat LCA to another aircraft, or vice versa. ***

***. ***.

Lighthouse effect and commercial momentum

Aircraft pricing is set at the time of the order and affects both the specific sales transaction, and according to Petitioner, future sales transactions. Boeing argues that price feedback from purchasers creates a mechanism by which purchasers expect comparably low prices for future sales, also called the "lighthouse effect." The effect is not limited to new orders or a formal sales campaign, but may also be made by existing customers for incremental product deliveries.[18] According to Boeing, *** Boeing identified the main drivers of price discovery as the relatively small number of sophisticated customers, highly publicized sales campaigns that occur infrequently, and information sources such as securities filings, lease company offers, and financial packages.[19]

Bombardier, however, stated that "***," noting that if Boeing were correct, one would expect to see additional C Series orders in the U.S. market, but none have occurred in the 13 months

[18] Petition, pp. 19, 49.

[19] Conference transcript, p. 37 (Nickelsburg). Boeing identified three reasons Republic Airways' C Series purchase did not have the same effect: price, significantly lower volumes, and Republic is not a "market leader." Boeing's postconference brief, app. 22-3.

since the Delta purchase.[20] Delta claimed that one of the characteristics of the aircraft industry is the high degree of price opacity, which limits the ability of price transmission in this industry.[21]

Ten importer/purchasers (including ***) stated that in general, they were not aware of prices that other purchasers have paid for 100- to 150-seat LCA. *** stated that it was broadly aware, and both it and *** stated that sometimes they received word-of-mouth information at conferences or industry events, but that such information was relatively vague. *** stated that it *** in combination with many other factors it uses in purchase negotiations.

When asked how the outcome of prior sales in the 100- to 150-seat LCA market affects their purchase price expectations, most importer/purchasers stated that they did not know other prior sales prices, so the effect is small. However, *** stated that if they knew, they would expect comparable discounts. *** stated that ***. *** stated that competition for an order is "what affects price." Firms did not respond differently for prior sales of current, derivative, or clean-sheet models.

[20] Bombardier's postconference brief, p. 28.
[21] Delta's postconference brief, pp. 28-29.

Questionnaire bid data

In the preliminary phase of these investigations, U.S. and foreign producers were asked to provide bid data for bids since January 1, 2014. For each bid/sales campaign, they were requested to provide the following information: for initial and final offers—customer, offer date, offer model(s), aircraft specifications, firm order units offered, included engine price, ancillary items per aircraft, delivery terms, payment terms, and offer acceptance, as well as a description of factors driving changes in initial versus final offers. Boeing provided bid data for *** individual sales campaigns, *** (table V-3a). Bombardier provided bid data for *** individual sales campaigns involving *** (table V-3b). Selected bid information is presented chronologically in table V-4. Of the seven bid events, only one had an accepted initial offer—***. *** of the *** Boeing ***. All ***. None of Boeing's bids showed a change ***

***.

Table V-3a
100- to 150-seat LCA: Boeing's bids since January 1, 2014, by customer, by model

* * * * * * *

Table V-3b
100- to 150-seat LCA: Bombardier's bids since January 1, 2014, by customer, by model

* * * * * * *

Table V-4
100- to 150-seat LCA: Boeing's and Bombardier's bid events since January 1, 2014, by date

* * * * * * *

Importer/purchasers' bid information

In the final phase of these investigations, importer/purchasers were also asked about bid solicitations or solicitations made to them since January 1, 2007. Four importer/purchasers

(***) indicated that they had been involved in such solicitations, although *** did not provide any additional information. Five importer/purchasers (***) indicated that they had not had any involvement in such solicitations.

Importer/purchaser bid information is summarized below. Importer/purchaser bid information does not exactly match the supplier bid information received in the preliminary phase. As shown in table V-4, ***.[22] Also, as discussed below, ***.[23]

***

***

[22] See email from ***.
[23] See email from ***.

***..

***

***.

***.

***

***.

***.

***

***.

***

***.[24] ***.[25]

LOST SALES AND LOST REVENUE

The Commission requested that U.S. producers of 100- to 150-seat LCA report purchasers where they experienced instances of lost sales or revenue due to competition from imports of 100- to 150-seat LCA from Canada during 2014-16. Boeing reported that it ***.[26] ***.

[24] ***,
[25] See also email from ***.
[26] Since it did not produce subject product in the United States, ***.

In the preliminary phase of these investigations, Boeing made one lost revenue allegation. The lost revenue allegation involved a sales campaign at United. According to Boeing, although it eventually succeeded in getting the contract for 65 100- to 150-seat LCAs, the reduced price would have resulted in a *** had the contract been fulfilled.[27] In responding to whether U.S. producers had reduced prices to compete with imports, ***. ***.

Also in the preliminary phase of these investigations, Boeing made one lost sales allegation. The lost sales allegation involved a sales campaign at Delta. According to Boeing, the ***. According to Boeing, Bombardier offered a price of $19.6 million per-100- to 150-seat LCA, which it alleges is significantly below the cost of production ($33.2 million) and below the price it charged Air Canada ($30 million). The lost sales allegation involved 75 100- to 150-seat LCAs with an option for 50 more planes.[28]

According to Delta representatives, "Boeing is not competing for new orders when we were negotiating with Bombardier. Boeing had no viable competitive alternatives to the CS100. We were not even considering any new Boeing product as an alternative when we made the

[27] United later converted the orders to orders for larger Boeing models with deferred delivery dates. Petition, p. 14.

[28] Petition, pp. 15-16.

purchase that Boeing challenges in the petition. Boeing offered us used E190s and Embraer Brazilian E190s, which we purchased and subsequently resold. At no time did Boeing even try to convince us to consider the 737 and 700. It would be wrong to suggest that Boeing lost sales to Delta because we purchased the CS100. Boeing simply was not in the mix. They did not have a plane that satisfied our mission profile and needs."[29] In addition, Delta stated that "Boeing also had made it clear during this time frame they had no slot availability in 2018 and 2019 to deliver aircraft in that critical time for us."[30]

In clarifying questionnaire responses, Delta also stated that ***

[29] Conference transcript, p. 182-3 (May).

[30] Conference transcript, p. 220-1 (May). According to Delta, Boeing's backlog meant that Delta would not be able to acquire "any significant number" of aircraft before 2020. Delta's postconference brief, p. 26. Delta adds that, as part of the offer from Boeing, ***." Delta's postconference brief, pp. 26, 34, and exh. 18.

***.[31]

Twelve importer/purchasers indicated that they had not purchased, or committed to purchase, Canadian 100- to 150-seat LCA instead of U.S.-produced 100- to 150-seat LCA since January 1, 2014. Similarly, six purchasers indicated that they had not done so for 100- to 150-seat LCA from nonsubject countries rather than U.S.-produced 100- to 150-seat LCA, in the same time period.

Additionally, importer/purchasers were asked if, since January 1, 2014, U.S. producers had reduced their prices of domestically produced 100- to 150-seat LCA in connection with a sale or offer to sell lower-priced 100- to 150-seat LCA from Canada or nonsubject countries. Five indicated that U.S. producers had not reduced prices in connection with any offers to sell Canadian 100- to 150-seat LCA at lower prices, and seven stated that they did not know. Four indicated that U.S. producers had not reduced prices in connection with any offers to sell 100- to 150-seat LCA from nonsubject countries at lower prices, and five stated that they did not know.

[31] ***.

PART VI: FINANCIAL EXPERIENCE OF U.S. PRODUCERS

BACKGROUND

Boeing, currently the sole U.S. producer of in-scope 100- to 150-seat LCAs, provided usable financial data.[1] The firm has a fiscal year-end of December 31. Overall, Boeing is a multibillion dollar firm that operates through five segments producing and selling a wide range of commercial aircraft, military manned and unmanned aircraft and weapons systems, networks and space systems, global services and support services. Boeing also offers operating leases, finance leases, and assets held for sale or re-lease through a finance segment.[2]

The Boeing model 737 series went into service in 1968 ("Classic 737") as a short- to medium-range twinjet narrow-body airliner. Boeing announced the 737 "Next Generation" series in 1993, which consisted of the 737-600, -700, -800, and -900 models. While retaining important commonality features with the Classic 737, the 737 Next Generation featured increased wing span, increased fuel capacity, and new CFM56-7B engines, which were quieter and more fuel efficient than the previous engines. These changes increased the range of the 737 Next Generation by 900 nautical miles permitting transcontinental service. The first 737-

[1] Boeing recognizes sales of commercial airplanes as each unit is completed and accepted by the customer. Sales recognized represent the price negotiated with the customer, ***. Boeing reported on the basis of U.S. GAAP. Airbus Americas does not currently produce a model in the United States comparable to the 737-700 or 737 MAX 7. Results of operations on the Boeing models 737-800 (MAX 8) and 737-900 (MAX 9) and comparable Airbus Americas' models A320 and A321, respectively, are shown in tables C-2 and C-3.

[2] Boeing 2016 Form 10-K, pp. 1-2. The commercial aircraft segment accounted for approximately 69 percent of Boeing's total sales revenues of $94.6 billion, and 54 percent of the firm's earnings from operations in 2016. Calculated from Boeing's 2016 Form 10-K, pp. 17 and 20.

700 model flew in February 1997.[3] The first delivery was to Southwest Airlines in December 1997 and Southwest Airlines remains that model's primary user.

Boeing announced the 737 MAX program in 2011 with three variants, 737 MAX 7, 737 MAX 8, and 737 MAX 9. Changes from the 737 Next Generation included the use of more efficient CFM International LEAP-1B engines, said to be a 14 percent lower fuel burn compared with the 737 Next Generation, split-tip winglets, and modifications to the airframe, and landing gear. The 737 MAX 7 reportedly is a design derived from the MAX 8, with structural re-gauging and strengthening, and systems and interior modifications to accommodate a longer length than the 737-700.[4] The 737 MAX 7 is scheduled to enter service in January 2019 compared with the 737 MAX 8, which test flew in January 2016 and obtained FAA certification on March 9, 2017.

OPERATIONS ON 100- TO 150-SEAT LCA

Table VI-1 presents data on Boeing's operations in relation to 100- to 150-seat LCA during 2014-16. The sales represent units that were delivered and accepted by the customer and costs are based on Boeing's unit costing and allocations as described. Table VI-2 presents data for changes in average unit values between periods.

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[3] Deliveries of all 737 models reached a cumulative total of 6,203 planes in 2016, up 490 planes from 2015, which was an increase of 495 planes over the cumulative total of 5,218 planes delivered as of end-2014. Boeing delivered a total of 748 planes in 2016, including models within the 737, 747, 767, 777, and 787 series. Boeing 2016 Form 10-K, p. 27.

[4] "Boeing 737 MAX," Wikipedia citing "Farnborough: Boeing's Execution on 737 MAX Sparkles as MAX 7.5 and MAX 10X Loom," Airways Magazine, July 10, 2016 and "Boeing confirms 737 MAX 7 redesign," Flight Global, July 11, 2016. Found at https://en.wikipedia.org/wiki/Boeing_737_Max, retrieved on December 5, 2017.

Table VI-1
100- to 150–seat LCA: Results of operations of Boeing, 2014-16, January-September 2016, and January-September 2017

Item	Calendar year			January-September	
	2014	2015	2016	2016	2017
	Quantity (units)				
Commercial sales[1]	***	***	***	***	***
Internal consumption[2]	***	***	***	***	***
Total net sales	***	***	***	***	***
	Value (1,000 dollars)				
Commercial sales[1]	***	***	***	***	***
Internal consumption[2]	***	***	***	***	***
Total net sales	***	***	***	***	***
Cost of goods sold:[3]-- Raw materials	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Total COGS	***	***	***	***	***
Gross profit	***	***	***	***	***
Total SG&A expense[4]	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Interest expense[5]	***	***	***	***	***
All other expenses[5]	***	***	***	***	***
All other income[5]	***	***	***	***	***
Net income or (loss)	***	***	***	***	***
Depreciation/amortization	***	***	***	***	***
Cash flow	***	***	***	***	***
	Ratio to net sales (percent)				
Cost of goods sold:[3]-- Raw materials	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Average COGS	***	***	***	***	***
Gross profit	***	***	***	***	***
SG&A expense	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Net income or (loss)	***	***	***	***	***

Table continued on the next page.

Table VI-1 -- Continued
100- to 150-seat LCA: Results of operations of Boeing, 2014-16, January-September 2016, and January-September 2017

Item	Calendar year			January-September	
	2014	2015	2016	2016	2017
	Unit value (1,000 dollars per unit)				
Commercial sales[1]	***	***	***	***	***
Internal consumption[2]	***	***	***	***	***
Total net sales	***	***	***	***	***
Cost of goods sold:[3]--					
Raw materials	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Total COGS	***	***	***	***	***
Gross profit	***	***	***	***	***
Total SG&A expenses[4]	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Net income or (loss)	***	***	***	***	***
	Number of firms reporting				
Operating losses	***	***	***	***	***
Net losses	***	***	***	***	***
Data	***	***	***	***	***

[1] Represents ***.
[2] Represents ***.
[3] The components of COGS include the following items: ***. See discussion of COGS later.
[4] SG&A expenses include the following items: ***.
[5] Other expenses include ***.

Note.—Boeing reported COGS on the basis of ***.

Source: Compiled from data submitted in response to a Commission questionnaire.

Table VI-2
100- to 150-seat LCA: Changes in average unit values, 2014-16, January-September 2016, and January-September 2017

Item	Between calendar years			Between partial year period
	2014-16	2014-15	2015-16	2016-17
	Change in AUVs (1,000 dollars per unit)			
Commercial sales	***	***	***	***
Internal consumption	***	***	***	***
Total net sales	***	***	***	***
Cost of goods sold:- Raw materials	***	***	***	***
Direct labor	***	***	***	***
Other factory costs	***	***	***	***
Average COGS	***	***	***	***
Gross profit	***	***	***	***
SG&A expense	***	***	***	***
Operating income or (loss)	***	***	***	***
Net income or (loss)	***	***	***	***

Source: Calculated from the questionnaire data presented in table VI-1.

Total net sales

As may be seen from the data in table VI-1, Boeing reported the deliveries of a ***.

Table VI-3 shows the results of operations of Boeing with respect to 100- to 150-seat LCA from 2007 to 2016. These data include ***.

Table VI-3
100- to 150-seat LCA: Selected results of operations of Boeing, 2007-16

Year	Selected financial indicators					
	Net sales quantity (units)	Net sales value (1,000 dollars)	Average unit net sales (1,000 dollars per unit)	Operating income (1,000 dollars)	Average unit operating income (1,000 dollars)	Operating margin (percent)
2007	***	***	***	***	***	***
2008	***	***	***	***	***	***
2009	***	***	***	***	***	***
2010	***	***	***	***	***	***
2011	***	***	***	***	***	***
2012	***	***	***	***	***	***
2013	***	***	***	***	***	***
2014	***	***	***	***	***	***
2015	***	***	***	***	***	***
2016	***	***	***	***	***	***
Total/ average	***	***	***	***	***	***

Source: Compiled from data submitted in response to a Commission questionnaire.

Data from table VI-3 for the average unit value and average unit value of operating income per aircraft are shown graphically in figure VI-1.

Figure VI-1
100- to 150-seat LCA: Selected results of operations of Boeing, 2007-16

* * * * * * *

Source: Compiled from data submitted in response to a Commission questionnaire.

Operating costs and expenses

In its questionnaire response, Boeing provided cost data ***.[5] Total COGS is based on

***

[5] Boeing reported COGS using ***. Boeing's U.S. producer questionnaire response, sections III-18 and III-4 and correspondence Boeing 11-27-17 (EDIS document 629889).

For financial accounting purposes, Boeing applies program accounting to allocate cost of goods sold. Under program accounting, ***. As noted in Boeing's 2016 Form 10-K, "the accounting quantity is our estimate of the quantity of airplanes that will be produced for delivery under existing and anticipated contracts. The determination of the accounting quantity is limited by the ability to make reasonably dependable estimates of the revenue and cost of existing and anticipated contracts. The accounting quantity for each program may include units that have been delivered, undelivered units under contract, and units anticipated to be under contract in the reasonable future (anticipated orders). In developing total program estimates, all of these items within the accounting quantity must be considered." Boeing 2016 Form 10-K, pp. 45 and 57 (as filed).

***.[6]

As can be seen from the data in table VI-1, ***. Total COGS and the ratio of total COGS to net sales were lower in interim 2017 compared to interim 2016. The category of raw materials, ***. The two cost categories of direct labor and other factory costs, which are described in the notes to table VI-1, ***. SG&A expenses also declined from 2014 to 2016, *** and were lower in interim 2017. Boeing reported that research and development costs were

[6] Boeing stated in response to a question from staff, ***. Correspondence Boeing 11-27-17 (EDIS document 629889).

classified in ***.[7] R&D expenses ***.[8] ***.[9]

Profitability

With the ***, gross profit declined *** from 2014 to 2016. With the ***, operating income likewise declined *** from 2014 to 2016 and in interim 2017 compared with interim 2016 (although the ratio of operating income to total net sales was slightly higher in interim 2017). Net income before taxes and cash flow (the sum of net income and depreciation charges) followed the same trends as operating income.

[7] ***. Boeing questionnaire response, sections III-18 and III-11b.
[8] Questionnaire response of Boeing, section III-13d. See table VI-5.
[9] Questionnaire response of Boeing, section III-11a.

Variance analysis

A variance analysis for the operations of Boeing with respect to 100- to 150-seat LCA is presented in table VI-4.[10] The information for this variance analysis is derived from table VI-1. A variance analysis is a method to assess the changes in profitability from period to period by measuring the impact of changes in the relationships between price, cost, and volume. A calculation is made of the impact of each factor by varying only that factor while holding all other factors constant. The components of net sales variances are either favorable (positive), resulting in an increase in net sales and profitability or unfavorable (negative), resulting in the opposite. As the data depict the unfavorable volume variance (lower number of units delivered) and unfavorable cost/expense variance (unit costs/expenses rose) led to lower operating and net income. These unfavorable variances outweighed a favorable price variance.

[10] The Commission's variance analysis is calculated in three parts: Sales variance, cost of sales variance (COGS variance), and SG&A expense variance. Each part consists of a price variance (in the case of the sales variance) or a cost or expense variance (in the case of the COGS and SG&A expense variance), and a volume variance. The sales or cost/expense variance is calculated as the change in unit price or per-unit cost/expense times the new volume, while the volume variance is calculated as the change in volume times the old unit price or per-unit cost/expense. Summarized at the bottom of the table, the price variance is from sales; the cost/expense variance is the sum of those items from COGS and SG&A variances, respectively, and the volume variance is the sum of the volume components of the net sales, COGS, and SG&A expense variances. Here, the volume variance is more important than is usually the case.

Table VI-4
100- to 150-seat LCA: Variance analysis on the operations of Boeing, 2014-16, January-September 2016, and January-September 2017

Item	Between calendar years			Between partial year period
	2014-16	2014-15	2015-16	2016-17
	Value (1,000 dollars)			
Total net sales:				
Price variance	***	***	***	***
Volume variance	***	***	***	***
Total net sales variance	***	***	***	***
Total COGS:				
Cost variance	***	***	***	***
Volume variance	***	***	***	***
Total COGS variance	***	***	***	***
Gross profit variance	***	***	***	***
SG&A expenses:				
Cost/expense variance	***	***	***	***
Volume variance	***	***	***	***
Total SG&A expense variance	***	***	***	***
Operating income variance	***	***	***	***
Summarized (at the operating income level) as:				
Price variance	***	***	***	***
Net cost/expense variance	***	***	***	***
Net volume variance	***	***	***	***
Financial expenses:				
Cost/expense variance	***	***	***	***
Volume variance	***	***	***	***
Total SG&A expense variance	***	***	***	***
Net income variance	***	***	***	***
Summarized (at the net income level) as:				
Price variance	***	***	***	***
Net cost/expense variance	***	***	***	***
Net volume variance	***	***	***	***

Source: Compiled from data submitted in response to a Commission questionnaire.

CAPITAL EXPENDITURES AND RESEARCH AND DEVELOPMENT EXPENSES

In accounting terms, capital expenditures increase the value of specific plant and equipment and total assets, while charges for depreciation and amortization (in the case of intangible assets), impairments, and divestitures (or retirement or abandonment of property) decrease the value of assets. Capital expenditures are made and research and development ("R&D") expenses are incurred to achieve improvements in equipment and the quality of products produced or reduce operating costs.

Boeing stated that R&D expenses consist of ***.[11] As previously noted, R&D expenses ***.

Table VI-5 presents capital expenditures and R&D expenses as reported by Boeing.[12] The data are presented separately for the 737-700 and 737 MAX 7 models.

[11] ***.

[12] Airbus Americas operates a facility in Mobile, Alabama for the production of the Airbus A321 and A320 models. The firm reported capital expenditures of ***. Airbus does not consider either of these models to be within the scope and the data are not included in this part of the report. Data on Airbus Americas' operations on these two models are included in tables C-2 and C-3.

Table VI-5
100- to 150–seat LCA: Capital expenditures and R&D expenses of Boeing, 2007-16, January-September 2016, and January-September 2017, and estimated full years 2017 and 2018

Period	Capital expenditures				
	737-700	Max 7	Total	737-700	Max 7
	Value (1,000 dollars)			Share of total (percent)	
2007	***	***	***	***	***
2008	***	***	***	***	***
2009	***	***	***	***	***
2010	***	***	***	***	***
2011	***	***	***	***	***
2012	***	***	***	***	***
2013	***	***	***	***	***
2014	***	***	***	***	***
2015	***	***	***	***	***
2016	***	***	***	***	***
2016 Jan-Sept	***	***	***	***	***
2017 Jan-Sept	***	***	***	***	***
2017 (estimated)	***	***	***	***	***
2018 (estimated)	***	***	***	***	***
Period	Research and development expenses				
	737-700	Max 7	Total	737-700	Max 7
	Value (1,000 dollars)			Share of total (percent)	
2007	***	***	***	***	***
2008	***	***	***	***	***
2009	***	***	***	***	***
2010	***	***	***	***	***
2011	***	***	***	***	***
2012	***	***	***	***	***
2013	***	***	***	***	***
2014	***	***	***	***	***
2015	***	***	***	***	***
2016	***	***	***	***	***
2016 Jan-Sept	***	***	***	***	***
2017 Jan-Sept	***	***	***	***	***
2017 (estimated)	***	***	***	***	***
2018 (estimated)	***	***	***	***	***

Source: Compiled from data submitted in response to a Commission questionnaire.

Boeing's statements regarding the nature, focus, and significance of the firm's capital expenditures are shown in the following tabulation:

737-700. . . . . ***.

737-MAX 7. . . ***.

Boeing reported that it ***.[13]

ASSETS AND RETURN ON ASSETS

Table VI-6 presents data on Boeing's total assets and the return on assets ("ROA") (calculated as the ratio of operating income to total assets). Boeing described the composition of total assets as follows: ***.[14]

[13] ***.

[14] ***.

Table VI-6
100- to 150–seat LCA: Boeing's total assets and return on assets, 2014-16

Item	Fiscal years		
	2014	2015	2016
Total net assets (1,000 dollars)	***	***	***
Average operating return on assets (percent)	***	***	***

Source: Compiled from data submitted in response to a Commission questionnaire.

Boeing stated that total assets are ***.[15] Boeing provided data on total assets from 2007-16, which indicated a steady decrease from $*** in 2007 to $*** in 2010, an increase to $*** in 2011, an *** decrease between 2011 and 2015, and an increase in 2016. Boeing estimated total assets for full year 2017 at $***, split between 700-700 at $*** and 737 MAX 7 at $***. Boeing also provided data on ***.[16]

[15] ***.
[16] ***.

CAPITAL AND INVESTMENT

The Commission requested Boeing to describe any actual or potential negative effects of imports of 100- to 150-seat large civil aircraft from Canada on the firm's growth, investment, ability to raise capital, development and production efforts, or the scale of capital investments. Table VI-7 presents Boeing's responses.

Table VI-7
100- to 150–seat LCA: Negative effects of imports from Canada on investment, growth, and development since January 1, 2014 and anticipated negative effects of imports from Canada

* * * * * * *

Source: Compiled from data submitted in response to a Commission questionnaire.

Table VI-8 presents Boeing's narrative responses on actual negative effects on growth and development and anticipated effects of imports.

Table VI-8
100- to 150–seat LCA: Boeing's narrative responses on actual and anticipated negative effects on growth, and development and anticipated effects of imports since January 1, 2014

Item	Reported changes in operations
Other :	
Boeing	***. ***

Table continued on the next page.

Table VI-8 -- Continued
100- to 150–seat LCA: Boeing's narrative responses on actual and anticipated negative effects on growth, and development and anticipated effects of imports since January 1, 2014

Anticipated effects of imports:	
Boeing	***. ***. ***. ***. ***

Source: Compiled from data submitted in response to a Commission questionnaire.

PART VII: THREAT CONSIDERATIONS AND INFORMATION ON NONSUBJECT COUNTRIES

Section 771(7)(F)(i) of the Act (19 U.S.C. § 1677(7)(F)(i)) provides that—

> *In determining whether an industry in the United States is threatened with material injury by reason of imports (or sales for importation) of the subject merchandise, the Commission shall consider, among other relevant economic factors*[1]*--*
>
> *(I) if a countervailable subsidy is involved, such information as may be presented to it by the administering authority as to the nature of the subsidy (particularly as to whether the countervailable subsidy is a subsidy described in Article 3 or 6.1 of the Subsidies Agreement), and whether imports of the subject merchandise are likely to increase,*
>
> *(II) any existing unused production capacity or imminent, substantial increase in production capacity in the exporting country indicating the likelihood of substantially increased imports of the subject merchandise into the United States, taking into account the availability of other export markets to absorb any additional exports,*
>
> *(III) a significant rate of increase of the volume or market penetration of imports of the subject merchandise indicating the likelihood of substantially increased imports,*
>
> *(IV) whether imports of the subject merchandise are entering at prices that are likely to have a significant depressing or suppressing effect on domestic prices, and are likely to increase demand for further imports,*
>
> *(V) inventories of the subject merchandise,*

---

[1] Section 771(7)(F)(ii) of the Act (19 U.S.C. § 1677(7)(F)(ii)) provides that "The Commission shall consider {these factors} . . . as a whole in making a determination of whether further dumped or subsidized imports are imminent and whether material injury by reason of imports would occur unless an order is issued or a suspension agreement is accepted under this title. The presence or absence of any factor which the Commission is required to consider . . . shall not necessarily give decisive guidance with respect to the determination. Such a determination may not be made on the basis of mere conjecture or supposition."

(VI) the potential for product-shifting if production facilities in the foreign country, which can be used to produce the subject merchandise, are currently being used to produce other products,

(VII) in any investigation under this title which involves imports of both a raw agricultural product (within the meaning of paragraph (4)(E)(iv)) and any product processed from such raw agricultural product, the likelihood that there will be increased imports, by reason of product shifting, if there is an affirmative determination by the Commission under section 705(b)(1) or 735(b)(1) with respect to either the raw agricultural product or the processed agricultural product (but not both),

(VIII) the actual and potential negative effects on the existing development and production efforts of the domestic industry, including efforts to develop a derivative or more advanced version of the domestic like product, and

(IX) any other demonstrable adverse trends that indicate the probability that there is likely to be material injury by reason of imports (or sale for importation) of the subject merchandise (whether or not it is actually being imported at the time).[2]

Information on the nature of the subsidies was presented earlier in this report; information on the volume and pricing of imports of the subject merchandise is presented in *Parts IV* and *V*; and information on the effects of imports of the subject merchandise on U.S. producers' existing development and production efforts is presented in *Part VI*. Information on inventories of the subject merchandise; foreign producers' operations, including the potential for "product-shifting;" any other threat indicators, if applicable; and any trade actions in third-country markets, follows. Also presented in this section of the report is information obtained

[2] Section 771(7)(F)(iii) of the Act (19 U.S.C. § 1677(7)(F)(iii)) further provides that, in antidumping investigations, ". . . the Commission shall consider whether dumping in the markets of foreign countries (as evidenced by dumping findings or antidumping remedies in other WTO member markets against the same class or kind of merchandise manufactured or exported by the same party as under investigation) suggests a threat of material injury to the domestic industry."

for consideration by the Commission on 100- to 150-seat LCA production in nonsubject countries.

THE INDUSTRY IN CANADA

Overview

The Commission issued foreign producers' or exporters' questionnaires to one firm, Bombardier, believed to be the only producer and exporter of 100- to 150-seat LCA from Canada. Bombardier submitted a usable response to the Commission's questionnaire. This firm's exports to the United States account for *** of 100- to 150-seat LCA from Canada.[3] According to Bombardier's estimates, the production of 100- to 150-seat LCA in Canada reported in this section of the report accounts for *** percent of production of 100- to 150-seat LCA in Canada. Table VII-1 summarizes Bombardier's 100- to 150-seat LCA operations in Canada.

Table VII-1
100- to 150-seat LCA: Summary data for producer in Canada, 2016

Firm	Production (units)	Share of reported production (percent)	Exports to the United States (units)	Share of reported exports to the United States (percent)	Total shipments (units)	Share of firm's total shipments exported to the United States (percent)
Bombardier	***	***	***	***	***	***
Total	***	***	***	***	***	***

Source: Compiled from data submitted in response to Commission questionnaires.

[3] As explained in Table VII-2 below, ***.

Changes in operations

As presented in table VII-2, Bombardier reported several operational and organizational changes since January 1, 2014.

Table VII-2
100- to 150-seat LCA: Bombardier's reported changes in operations, since January 1, 2014

* * * * * * *

Operations on 100- to 150-seat LCA

Table VII-3 presents information on the 100- to 150-seat LCA operations of Bombardier. These data show that Bombardier ***. These units were subsequently ***. Bombardier explained that ***. Bombardier ***. Bombardier also noted that it is not possible to switch production from its C Series aircraft to its CRJ family of regional jets since they are manufactured on different production lines that have different tooling and manufacturing processes.[4] In its questionnaire, the firm indicated that ***.

[4] Conference transcript, p. 198 (Mullot).

Table VII-3
100- to 150-seat LCA: Data on industry in Canada, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Table VII-4 presents information on the overall operations of Bombardier. These data show that 100- to 150-seat LCA accounted for *** percent of the total number of aircraft produced by Bombardier in 2016, and for *** percent of such production in January-September 2017. ***

*** accounted for *** of Bombardier's total production throughout the period in which data were collected.[5]

Table VII-4
All aircraft: Total production of aircraft by producers in Canada, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

[5] Bombardier reported that its production of ***. Bombardier's foreign producers' questionnaire response, II-3a.

Onerous contract provision

Bombardier[6] recognized a loss of $516 million in 2016 under the "onerous contracts provision" under International Financial Reporting Standards ("IFRS"). In the firm's annual report it stated that this loss was recognized on the closing of firm aircraft orders in its C series aircraft program during the second quarter of 2016.[7] As Bombardier explained in its annual financial statements, "an onerous contract provision is recorded if it is more likely than not that the unavoidable costs of meeting the obligations under a firm contract, exceed the economic benefits expected to be received under the contract."[8] [9] The amount of $486 million (net of the balance that was included in corporate and eliminations) was included in cost of sales in 2016, leading to a net loss after special items but before interest and taxes of $903 million for the commercial aircraft segment of Bombardier.

---

[6] Bombardier Inc. is a company organized under the laws of Canada. Its accounting statements are reported under IFRS. The amounts in Bombardier's annual report are expressed in U.S. dollars.

[7] Bombardier Inc. Financial Report, Fiscal Year Ended December 31, 2016 ("Bombardier 2016 Financial Report"), pp. 8, 57, 66, and 70. In a table (page 70) showing orders by customer in 2016, in the second quarter of 2016, Delta Airlines is shown as a buyer of 75 CS100 with options for 50 CS100; Air Canada and Air Baltic are shown as buyers of 45 CS300 (options for an additional 30 CS300) and 7 CS300, respectively. Testimony at the staff conference focused on Delta's purchase from Bombardier.

[8] Bombardier 2016 Financial Report, p. 123. In other words, if a contract review indicates a negative gross margin, the entire expected loss on the contract is recognized in cost of sales in the period in which the negative gross margin is identified. The note also states that "unavoidable costs exclude the allocation of certain indirect overheads which are included in the cost of inventories, such as amortization. As early production units in a new aircraft program require higher costs than units produced later in the program, cost estimates also depend on expected delivery schedules. The estimates are reviewed on a quarterly basis."

[9] IFRS and U.S. Generally Accepted Accounting Principles are similar in many respects. The Financial Accounting Standards Board (FASB) decided in 2014 to exclude specific guidance for onerous contracts and to retain the existing guidance on the provision for loss contracts in the revenue recognition principles for construction type and production type contracts. It should be pointed out that the onerous contract provision and related revenue recognition are not the same as program accounting.

Projected operations on 100- to 150-seat LCA

As shown in table VII-5, Bombardier ***. Bombardier explained that ***." The data reported in table VII-5 ***. Bombardier ***.[10]

[10] Bombardier's foreign producers' questionnaire response, attached supplement to II-11a .

Table VII-5
100- to 150-seat LCA: Projected data on industry in Canada, 2017-22

* * * * * * *

Canadian producer's orders

The Commission received information on orders from one Canadian producer: Bombardier. Bombardier provided information on its orders of two 100- to 150-seat LCA: the CS100 model and the CS300 model.

Order details

Bombardier had orders for a total of 360 100- to 150-seat LCA as of September 30, 2017: 123 CS100 units and 237 CS300 units. Delta accounted for the largest share of these orders, with an order for 75 CS100 units. Other entities with relatively large orders for the 100- to 150-seat LCA included Air Canada (with an order for 45 CS300 units) as well as Macquarie AirFinance and Republic[11] (both with orders for 40 CS300 units). Bombardier reported that 341 units are part of the current backlog.[12]

In its questionnaire response, Bombardier reported that ***.[13] ***.

[11] Republic is currently in bankruptcy and it is unclear whether these orders will ever be delivered. In October 2016, Republic and Bombardier reached a settlement providing deferral of all C Series deliveries to Republic. Petition, p. 28, n. 86, p. 67.

[12] Bombardier, "September 30, 2017: Program Status Report - C Series aircraft," http://www.bombardier.com/content/dam/Websites/bombardiercom/supporting-documents/BA/Bombardier-Aerospace-20170930-CSeries-Program-Status-en.pdf (accessed November 21, 2017).

[13] Bombardier ***. Bombardier's foreign producers' questionnaire response, attached supplement to II-11a.

Order backlog

Bombardier reported a total backlog of orders for the subject aircraft that ranged from *** units on various dates between December 31, 2014 and September 30, 2017 (table VII-6).

Table VII-6
100- to 150-seat LCA: Canadian producer's end-of-period backlog, 2014-16, January to September 2016, and January to September 2017

* * * * * * *

Order pricing

Bombardier reported the total price of individual CS100 units to be approximately $***, while the total price of individual CS300 units is approximately $***. The prices of Bombardier's future orders for 100- to 150-seat LCA include ***. Ancillary items account for ***. Bombardier also indicated that ***

***.

Order delivery

Bombardier reported that the average length of time between orders and deliveries is ***. Bombardier's ***.

Order risk and cancellation

Bombardier indicated in its questionnaire response that ***.

Exports

According to GTA, Canada's leading export markets in 2016 for aircraft greater than 15,000 kgs—which include out-of-scope aircraft such as military aircraft, cargo aircraft, and used passenger aircraft—were the United States, China, Malta, and Spain (table VII-7). During

2016, the United States was the top export market for aircraft greater than 15,000 kgs from Canada, accounting for 38.3 percent, followed by China, Malta, and Spain, all accounting for 8.4 percent, respectively.

Table VII-7
Aircraft greater than 15,000 kgs: Exports from Canada by destination market, 2014-16

Destination market	Calendar year		
	2014	2015	2016
	Quantity (units)		
Canada exports to the United States	97	86	41
Canada exports to other major destination markets.--			
China	11	10	9
Malta	10	10	9
Spain	---	---	9
Finland	1	---	5
Switzerland	1	---	5
United Kingdom	5	5	5
Japan	1	1	4
Germany	---	---	3
All other destination markets	37	36	17
Total Canada exports	163	148	107
	Value (1,000 dollars)		
Canada exports to the United States	2,888,042	2,632,432	1,329,060
Canada exports to other major destination markets.--			
China	359,486	267,691	288,957
Malta	475,644	492,244	452,591
Spain	---	---	264,589
Finland	50,002	---	120,269
Switzerland	43,037	---	261,988
United Kingdom	231,008	220,181	218,952
Japan	32,445	32,911	104,662
Germany	---	---	92,747
All other destination markets	1,241,971	1,322,890	538,422
Total Canada exports	5,321,635	4,968,349	3,672,237

Table continued on next page.

Table IV-7--Continued
Aircraft greater than 15,000 kgs: Exports from Canada by destination market, 2014-16

Destination market	Calendar year		
	2014	2015	2016
	Unit value (1,000 dollars per unit)		
Canada exports to the United States	29,774	30,610	32,416
Canada exports to other major destination markets.--			
China	32,681	26,769	32,106
Malta	47,564	49,224	50,288
Spain	---	---	29,399
Finland	50,002	---	24,054
Switzerland	43,037	---	52,398
United Kingdom	46,202	44,036	43,790
Japan	32,445	32,911	26,165
Germany	---	---	30,916
All other destination markets	33,567	36,747	31,672
Total Canada exports	32,648	33,570	34,320
	Share of quantity (percent)		
Canada exports to the United States	59.5	58.1	38.3
Canada exports to other major destination markets.--			
China	6.7	6.8	8.4
Malta	6.1	6.8	8.4
Spain	---	---	8.4
Finland	0.6	---	4.7
Switzerland	0.6	---	4.7
United Kingdom	3.1	3.4	4.7
Japan	0.6	0.7	3.7
Germany	---	---	2.8
All other destination markets	22.7	24.3	15.9
Total Canada exports	100.0	100.0	100.0

Note.--Global trade at the 6-digit level includes primarily out-of-scope products (military aircraft, cargo aircraft, used passenger aircraft, and large civil aircraft that do not match the scope of these investigations).

Note.--These data are all exports of Bombardier. Two other aerospace companies in Canada, Diamond Aircraft and Viking Air produce small jets that weight less than 15,000 kgs and are therefore not included in these export data. “Our Aircraft,” http://www.diamondaircraft.com/our-aircraft/; Viking Aircraft, https://www.vikingair.com/viking-aircraft.

Source: Official exports statistics under HS subheading 8802.40 as reported by Canada Customs in the IHS/GTA database, accessed October 30, 2017.

END-OF-PERIOD INVENTORIES

Bombardier *** during 2014-16, January to September 2016, and January to September 2017. In addition, U.S. importers/purchasers' end-of-period inventories reflect the number of 100- to 150-seat LCA in their fleet. Therefore, these numbers are not true inventories of merchandise available for sale.

PROJECTED U.S. IMPORTS AND/OR PURCHASES OF 100- TO 150-SEAT LCA

Table VII-8 presents data on projected U.S. imports and/or purchases, by source, during 2017-22. These data show that *** of projected imports/purchases are of ***. ***. In addition, ***.[14]

[14] ***.

Table VII-8
100- to 150-seat LCA: Projected U.S. imports and/or purchases, by source, 2017-22

* * * * * * *

ANTIDUMPING OR COUNTERVAILING DUTY ORDERS IN THIRD-COUNTRY MARKETS

There have been no antidumping duty, countervailing duty, or safeguard investigations on aircraft in any third country.

INFORMATION ON NONSUBJECT COUNTRIES[15]

European Union

Airbus is the only producer of 100- to 150-seat LCA that operates final production facilities in nonsubject countries. Final production facilities for the Airbus A319ceo and Airbus A319neo are located in Hamburg, Germany and Tianjin, China.[16] However, as of September 2017, the United States has not imported any subject aircraft from China.[17] Therefore, Germany is the only nonsubject source of 100- to 150-seat LCA. Airbus also operates a production facility in the United States, but ***.

Based on the Ascend database,[18] Airbus delivered 54 A319ceo aircraft units to U.S. purchasers in the United States between 2007 and 2016, representing 28.1 percent of U.S. deliveries of 100- to 150-seat LCA for that period. For comparison, Boeing delivered 138 737-

[15] 100- to 150-seat LCA are imported under HTS 8802.40.0040 which covers all passenger aircraft greater than 15,000kg. This is an extremely broad category which includes all passenger planes ranging from smaller regional jets to the largest category of civil aircraft. Export analysis of specific aircraft models would therefore be impractical due to the range of aircraft covered by the reporting number.

[16] Airbus, "Final Assembly and Tests," http://www.airbus.com/company/aircraft-manufacture/how-is-an-aircraft-built/final-assembly-and-tests/.

[17] Official U.S. imports based on General Imports using statistical reporting number 8802.40.0040 (accessed on October 30, 2017).

[18] Petition, Vol I, exh. 44. Data reported in this database may not fully match the data reported in questionnaire responses. The database, for example, ***. ***.

700 aircraft units during the same period, accounting for the remaining 71.9 percent of U.S. deliveries.[19] Between 2017 and 2022, a projected shift in aircraft model deliveries is reflected by the replacement of the Boeing 737-700 and Airbus A319ceo models with their derivatives, the Boeing 737 MAX 7 and Airbus A319neo models. Projected U.S. imports/purchases of subject 100- to 150-seat LCA between 2017 and 2022 include *** Boeing 737-700, *** Boeing 737 MAX 7 units, *** Bombardier CS100 units, and *** Airbus A319neo units. There are no current projected deliveries of the Bombardier CS300 model to purchasers in the United States. Therefore, 10.7 percent of U.S. deliveries of 100- to 150-seat large civil aircraft are projected to be from nonsubject countries between 2017 and 2022.[20]

Brazil

Empresa Brasileira de Aeronáutica S.A. ("Embraer") was founded in 1969 as Brazil's state-owned aerospace company but was later privatized in 1994 following an economic crisis in the late 1980s.[21] However, the Brazilian government retained a special class of shares in the company known as "golden shares" which allow for veto power over certain strategic decisions.[22] Embraer focuses on manufacturing regional and executive jets. In 2011, it switched

[19] Ibid.

[20] Compiled from data submitted in response to Commission questionnaires

[21] Embraer, "Who We Are," http://www.embraer.com/en-US/ConhecaEmbraer/TradicaoHistoria/Pages/default.aspx ; Novais, "Understand Embraer," The Brazil Business, June 13, 2012, http://thebrazilbusiness.com/article/understand-embraer; Embraer, "90's Events," http://www.centrohistoricoembraer.com.br/sites/timeline/en-US/Pages/default.aspx#todos/1990 .

[22] Embraer, "Governance," http://www.embraer.com/en-US/ConhecaEmbraer/Governanca/Pages/default.aspx.

plans from designing an in-scope aircraft capable of transporting 130 to 160 passengers to instead focus on creating a redesign of its smaller E-Jet family.[23]

The Embraer E190-E2 and Embraer E195-E2 are the redesigned and slightly larger versions of the Embraer E190 and Embraer E195. The Embraer E195-E2 is Embraer's largest aircraft offering and had its first flight on March 29, 2017. It is capable of transporting 120 passengers in a three-class seating arrangement and 132 passengers in a singular class. The Embraer E195-E2 has a range of 2,450 nautical miles.[24] The Embraer E190-E2 transports fewer passengers, 97 in a three-class seating arraignment and 106 in a singular class, but has a longer range of 2,850 nautical miles.[25] While Embraer's new E-jet offerings are similar in seating capacity to 100- to 150-seat large civil aircraft, their lower nautical mile range classifies them as regional jets.

China

The Commercial Aircraft Corporation of China, Ltd. ("COMAC") is a state-owned corporation approved and jointly-invested in by the State Council of the People's Republic of China. COMAC was founded in 2008 and is comprised of nine organizations with responsibilities including research and development, manufacturing, customer service, and flight test centers. The main purpose of COMAC is to industrialize China's commercial aircraft industry through the production of both large civil aircraft as well as smaller, regional jets.[26] COMAC has been

[23] Trimble, "Embraer Commits to Re-Engined E-Jets," FlightGlobal, November 10, 2011 https://www.flightglobal.com/news/articles/embraer-commits-to-re-engined-e-jets-364603/.
[24] Embraer, "E195-E2. The Profit Hunter," http://www.e2fleetsmart.com/e195-e2/.
[25] Embraer, "E190-E2," http://www.e2fleetsmart.com/e190-e2/.
[26] COMAC, "Introduction," http://english.comac.cc/aboutus/introduction/.

working with other companies in an effort to expand its aerospace offerings. COMAC and Bombardier have recently been collaborating about a possible investment by COMAC into Bombardier's C Series program.[27] Additionally, on May 22, 2017, COMAC and United Aircraft Corporation ("UAC") (a Russian LCA producer) entered into a joint venture with the purpose of producing larger, wide-body jets capable of transporting around 280 passengers a distance of 6,500 nautical miles.[28]

COMAC does not currently produce aircraft that fall within the scope of these investigations. Instead, its most similar aircraft are the slightly smaller COMAC ARJ21-700 and the slightly larger COMAC C919. The ARJ21-700 is a regional aircraft capable of transporting 78 passengers in a typical, two-class seating arrangement and has a range of 1,998 nautical miles.[29] A larger model, the ARJ21-900 has yet to launch, but it would still be classified as a regional jet rather than a 100- to 150-seat large civil aircraft.[30] Alternatively, the recent advent of the COMAC C919 is slightly larger than in-scope aircraft and capable of transporting 158 passengers in a typical, two-class seating arrangement. The COMAC C919 has a range of 2,999 nautical miles.[31]

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[27] Weinland, "Chinese Group in Talks to Aid Struggling Jet Maker Bombardier," Financial times, https://www.ft.com/content/0003ce56-3ba4-11e7-821a-6027b8a20f23.

[28] The joint venture is the China-Russia Commercial Aircraft International Co., Ltd (CRAIC). COMAC, "China-Russia Commercial Aircraft International Co., Ltd Established," May 22, 2017, http://english.comac.cc/news/latest/201705/24/t20170524_5262164.shtml.

[29] COMAC, "ARJ21," http://english.comac.cc/products/rj/.

[30] Perrett, "With ARJ21-700 Certified, Focus Shifts to Support," Aviation Week, January 20, 2015, http://aviationweek.com/commercial-aviation/arj21-700-certified-focus-shifts-support.

[31] COMAC, "C919," http://english.comac.cc/products/ca/; Waldron, "Pictures: Comac C919 Lands after uneventful Maiden Sortie," FlightGlobal, May 5, 2017, https://www.flightglobal.com/news/articles/comac-c919-lands-after-uneventful-maiden-sortie-436913/.

Russia

In 2006, the Public Joint-Stock Company UAC was established by RF Presidential Decree No. 140 and became the largest aircraft manufacturing company in Russia.[32] The UAC, which is majority owned by the Russian Government, is comprised of approximately 30 Russian aircraft manufacturers and companies, including the Sukhoi Company and the Irkut Corporation.[33] Currently focused on producing military aircraft, the UAC is expecting to increase its share of civil aircraft production from 20 percent of revenues in 2017 to 45 percent of revenues by 2035. This change in strategic goals is estimated to boost UAC's share of the global civil aircraft market from 1 percent in 2017 to 4.5 percent in 2025.[34] The two main civil aircraft families projected to drive this expansion are the Irkut MC-21 and the Sukhoi Superjet 100.[35]

The Irkut MC-21-300 is capable of transporting 163 passengers in a typical, two-class seating arrangement and has a range of 3,186 nautical miles.[36] It underwent its first test flight on May 28, 2017.[37] A slightly smaller model, the Irkut MC-21-200, would be considered in-scope but is not currently in production with assembly of the first prototype scheduled to begin in 2017.[38]

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[32] United Aircraft Corporation, "History," http://www.uacrussia.ru/en/corporation/history/.

[33] United Aircraft Corporation, "General Information," http://www.uacrussia.ru/en/investors/; Grossman, "Russia Says its New Commercial Airliner is as Good as Any Boeing or Airbus," Popular Mechanics, June 9, 2016. http://www.popularmechanics.com/flight/a21270/russian-build-commercial-airliner/.

[34] United Aircraft Corporation, "Strategy," http://www.uacrussia.ru/en/corporation/strategy/.

[35] United Aircraft Corporation, "History," http://www.uacrussia.ru/en/corporation/history/.

[36] United Aircraft Corporation, "MC-21 Aircraft Specification," http://www.uacrussia.ru/en/aircraft/lineup/civil/ms-21/aircraft-specific/.

[37] Polek, Gregory and Vladimir Karnozov, "Russia's Irkut MC-21-300 Performs First Flight," AIN Online, May 30, 2017. https://www.ainonline.com/aviation-news/air-transport/2017-05-30/russias-irkut-mc-21-300-performs-first-flight

[38] Pyadushkin, "Russia's MC-21 Airliner Prepares for First Flight," Aviation Week Shownews, July 12, 2016, http://aviationweek.com/shownews/russia-s-mc-21-airliner-prepares-first-flight.

Once completed, the Irkut MC-21-200 would be capable of transporting 135 passengers in a typical, two-class seating arrangement a range of 3,240 nautical miles.[39] The Sukhoi Superjet 100 is a smaller, regional aircraft capable of transporting 98 passengers in a typical, two-class seating arrangement with a maximum range of 2,472 nautical miles.[40] Plans for the next generation of the Sukhoi Superjet are still in preliminary stages with an estimated in service date after 2025. Details regarding the new model are scarce but it is expected to seat 130 passengers and have updated wing structures and engines.[41]

[39] United Aircraft Corporation, "MC-21 Aircraft Specification," http://www.uacrussia.ru/en/aircraft/lineup/civil/ms-21/aircraft-specific/.

[40] United Aircraft Corporation, "Sukhoi Superjet 100 Aircraft Specifications," http://www.uacrussia.ru/en/aircraft/lineup/civil/superjet-100/aircraft-specific/.

[41] Pyadushkin, Maxim, "Sukhoi Plans Next-Generation Superjet," Aviation Week, June 18, 2017. http://aviationweek.com/paris-air-show-2017/sukhoi-plans-next-generation-superjet

APPENDIX A

FEDERAL REGISTER NOTICES

The Commission makes available notices relevant to its investigations and reviews on its website, www.usitc.gov. In addition, the following tabulation presents, in chronological order, *Federal Register* notices issued by the Commission and Commerce during the current proceeding.

Citation	Title	Link
82 FR 20634 May 3, 2017	*100- to 150-Seat Large Civil Aircraft From Canada; Institution of Antidumping and Countervailing Duty Investigations and Scheduling of Preliminary Phase Investigations*	https://www.gpo.gov/fdsys/pkg/FR-2017-05-03/pdf/2017-08894.pdf
82 FR 24292 May 26, 2017	*100- to 150-Seat Large Civil Aircraft From Canada; Initiation of Countervailing Duty Investigation*	https://www.gpo.gov/fdsys/pkg/FR-2017-05-26/pdf/2017-10957.pdf
82 FR 24296 May 26, 2017	*100- to 150-Seat Large Civil Aircraft From Canada; Initiation of Less-Than-Fair-Value Investigation*	https://www.gpo.gov/fdsys/pkg/FR-2017-05-26/pdf/2017-10733.pdf
82 FR 27524 June 15, 2017	*100- to 150-Seat Large Civil Aircraft From Canada; Determinations*	https://www.gpo.gov/fdsys/pkg/FR-2017-06-15/pdf/2017-12436.pdf
82 FR 31045 July 5, 2017	*100- to 150-Seat Large Civil Aircraft From Canada; Postponement of Preliminary Determination Countervailing Duty Investigation*	https://www.gpo.gov/fdsys/pkg/FR-2017-07-05/pdf/2017-14057.pdf
82 FR 45807 October 2, 2017	*100- to 150-Seat Large Civil Aircraft From Canada; Preliminary Affirmative Countervailing Duty Determination and Alignment of Final Determination With Final Antidumping Duty Determination*	https://www.gpo.gov/fdsys/pkg/FR-2017-10-02/pdf/2017-21055.pdf
82 FR 47697 October 13, 2017	*100- to 150-Seat Large Civil Aircraft From Canada; Preliminary Affirmative Determination of Less-Than-Fair-Value*	https://www.gpo.gov/fdsys/pkg/FR-2017-10-13/pdf/2017-22203.pdf
82 FR 49850 October 27, 2017	*100- to 150-Seat Large Civil Aircraft From Canada; Scheduling of the Final Phase of Countervailing Duty and Antidumping Duty Investigations*	https://www.gpo.gov/fdsys/pkg/FR-2017-10-27/pdf/2017-23430.pdf

APPENDIX B

LIST OF HEARING WITNESSES {(RESERVED)}

APPENDIX C

SUMMARY DATA

OUTLINE

This appendix presents data for the domestic like product as well as for two alternative (expanded) domestic like products:

(1) Table C-1 presents data for 100- to 150-seat LCA, which include Boeing models 737-700 and 737-MAX 7 and Airbus A319.

(2) Table C-2 presents data for 100- to 150-seat LCA, Boeing models 737-800 and 737-MAX 8, and Airbus model A320. Airbus Americas began production of the comparable model A320 in 2016 with delivery beginning in 2017 (data reported in the January-September 2017 period).[1]

(3) Table C-3 presents data for all of the foregoing and Boeing models 737-900 and 737-MAX 9 and Airbus model A321. Airbus Americas began producing the comparable A321 in 2015 with delivery beginning in 2016 (data reported in 2016 and both interim periods).[1]

[1] ***.

Table C-1
100- to 150-seat LCA: Summary data concerning the U.S. market, 2014-16, January to September 2016, and January to September 2017

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Table C-2
100- to 150-seat LCA and 737-800 and equivalents: Summary data concerning the U.S. market, 2014-16, January to September 2016, and January to September 2017

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Table C-3
100- to 150-seat LCA and all other single aisle LCA: Summary data concerning the U.S. market, 2014-16, January to September 2016, and January to September 2017

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APPENDIX D

COMMENTS BY BOEING, CSALP, AND U.S. IMPORTER/PURCHASERS REGARDING THE COMPARABILITY OF 100- TO-150-SEAT LCA VS. OTHER SINGLE AISLE LCA

Table D-1
100- to 150-seat LCA: Boeing's responses to the like product factors narratives

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Table D-1--Continued
100- to 150-seat LCA: Boeing's responses to the like product factors narratives

* * * * * * *

Table D-1--Continued
100- to 150-seat LCA: Boeing's responses to the like product factors narratives

* * * * * * *

Table D-2
100- to 150-seat LCA: CSALP's responses to the like product factors narratives

* * * * * * *

Table D-3
100- to 150-seat LCA: U.S. importer/purchasers' responses to the like product factors narratives

* * * * * * *

Table D-3--Continued
100- to 150-seat LCA: U.S. importer/purchasers' responses to the like product factors narratives

* * * * * * *

Table D-3--Continued
100- to 150-seat LCA: U.S. importer/purchasers' responses to the like product factors narratives

* * * * * * *

Table D-3--Continued
100- to 150-seat LCA: U.S. importer/purchasers' responses to the like product factors narratives

* * * * * * *

Table D-3--Continued
100- to 150-seat LCA: U.S. importer/purchasers' responses to the like product factors narratives

* * * * * * *

Table D-3--Continued
100- to 150-seat LCA: U.S. importer/purchasers' responses to the like product factors narratives

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