Bombardier’s CRJ – Rumors of its Demise are Greatly Exaggerated
Executive Summary

- The CRJ program provides Bombardier with a product that remains “good enough” in the market because of the anomaly of the US scope clauses.

- Because the US represents about 70% of the market, it exerts tremendous influence and pressure on regional jet OEMs.

- No regional jet OEM can create a successful program if it cannot sell in the US market.

- As we demonstrate in figure 41 (page 51) if we play out scenarios using the four critical issues facing regional jet operators in the US, it is scope that acts as the “joker in the pack”.

- Bombardier can, at relatively low cost, continue to improve the CRJ’s performance to ensure it continues to offer operators “good enough” economic performance and remains competitive.

- The US regional airlines, in particular, face an ever-tightening business environment. Therefore, they are likely to continue to favor low risk and lowest cost aircraft options.

- Based on current guidance from the pilot unions and industry experts, the US scope clause does not appear to be heading for any easing. This rule ensures that US regional airlines cannot deploy next generation aircraft.

- The US regional airline margins may not justify the investment in the next generation aircraft. While regional jet operator outside the US are not directly subject to this rule, its impact is readily seen as an indirect influence.

- Consequently, when we consider the various equipment advances and technology improvements, we conclude that the Bombardier CRJ program remains a credible regional jet option. Rumors of its demise are over stated.
## Contents

Executive Summary ........................................................ 1

Contents ................................................................. 2

I. The CRJ Program................................................ 5

II. The Regional Jet Market ................................. 13

III. Competition..................................................... 40

IV. Comparative Economics .................................. 47

V. Program Outlook and Conclusions ............... 52

VI. Appendix........................................................ 53
# Table of Figures

- Figure 1 World Active Regional Jet Fleet ................................................................. 7
- Figure 2 Comparing regional jets ............................................................................. 8
- Figure 3 Planned improvements from E-175 to E175-E2 ........................................ 10
- Figure 4 E-175 & E175-E2 advantages over CRJ900NG ........................................ 11
- Figure 5 Potential CRJ re-engine choices ................................................................. 12
- Figure 6 In-Service Regional Jet Fleet ................................................................. 13
- Figure 7 Regional jets by seating ........................................................................... 14
- Figure 8 Bombardier and Embraer regional jet market share .................................. 14
- Figure 9 Bombardier and Embraer fleet and average seat count .............................. 16
- Figure 10 Bombardier and Embraer market share changes ...................................... 16
- Figure 11 Comparing Bombardier and Embraer models ......................................... 17
- Figure 12 Bombardier and Embraer parked fleet comparison .................................. 18
- Figure 13 Comparing Bombardier CRJ and Embraer E-17X in-service vs parked .... 18
- Figure 14 US regional airlines’ declining departures ............................................... 19
- Figure 15 US regional jet fleet 3Q16 ......................................................................... 20
- Figure 16 US regional airline fleet and age by OEM ............................................... 21
- Figure 17 US in-service jet fleet ............................................................................ 22
- Figure 18 EU regional jet fleet .............................................................................. 23
- Figure 19 EU in-service jet fleet ............................................................................ 23
- Figure 20 EU single aisle fleet by airline type ......................................................... 24
- Figure 21 EU Single aisle fleet by airline alliance ................................................. 24
- Figure 22 EU regional jet fleet age ......................................................................... 24
- Figure 23 ............................................................................................................... 26
- Figure 24 Bombardier and Embraer parked fleet 3Q16 .......................................... 28
- Figure 25 Asia/Pacific regional jet fleet and age ..................................................... 28
- Figure 26 ............................................................................................................... 30
Figure 27 Africa regional jet fleet and age ................................................................. 31
Figure 28 US airline in-service fleet ............................................................................ 32
Figure 29 US regional fleet growth and Jet A prices .................................................... 33
Figure 30 US regional fleet seat capacity switch .......................................................... 33
Figure 31 US scope compliant regional jets ................................................................. 34
Figure 32 Potential 2020 scope easing ....................................................................... 34
Figure 33 US passenger volume by flight range .......................................................... 36
Figure 34 US passenger traffic and commercial airline pilots ..................................... 37
Figure 35 Comparing regional and Delta Air Lines pay scales .................................... 39
Figure 36 Bombardier CRJ current competitors ......................................................... 40
Figure 37 Bombardier CRJ future competitors ........................................................... 40
Figure 38 500 Nautical mile missions ....................................................................... 48
Figure 39 Operating costs on 500 nautical mile mission .......................................... 49
Figure 40 Trip costs 500 nautical mile mission ......................................................... 49
Figure 41 Three potential scenarios .......................................................................... 51