

Does Fuel Hedging Make Economic Sense? The Case of the US Airline Industry

David A. Carter ^a, Daniel A. Rogers ^b, and Betty J. Simkins ^a

^a 301 Business Building, Oklahoma State University, Stillwater, OK 74078-4011, USA

^b School of Business Administration, Portland State University, Portland, OR 97207-0751, USA

December 11, 2003

Abstract

Does hedging add value to the firm, and if so, is the source of the added value consistent with hedging theory? We investigate jet fuel hedging behavior of firms in the US airline industry during 1994-2000 to examine whether such hedging is a source of value for these companies. We illustrate that the investment climate in the airline industry conforms well to the theoretic framework of Froot, Scharfstein, and Stein (1993). In general, airline industry investment opportunities correlate positively with jet fuel costs, while higher fuel costs are consistent with lower cash flow. Given that jet fuel costs are hedgeable, airlines with a desire for expansion may find value in hedging future purchases of jet fuel. Our results show that jet fuel hedging is positively related to airline firm value. The coefficients on the hedging indicator variables in our regression analysis suggest that the “hedging premium” constitutes approximately a 12-16 percent increase in firm value. We find that the positive relation between hedging and value increases in capital investment. This result is consistent with the assertion that the principal benefit of jet fuel hedging by airlines comes from reduction of underinvestment costs.

JEL Classification: G30, G31, G32, L93

Keywords: Hedging; Risk Management; Airline industry

We thank John Doukouris in the Office of Economics at the Air Transport Association and Pete Reig at Williams, Inc. for providing airline fuel cost data. We also thank Chiddi Chidambaran, Georges Dionne, Chitru Fernando, Tomas Jandik, Wayne Mikkelson, Thouraya Triki, Larry Wall, participants at the 2001 Eastern Finance Association meeting, 2001 FMA meetings, and 2003 FMA European meetings, and seminar participants at HEC Montréal, Kent State University, the 2003 Southwest Finance Symposium at the University of Tulsa, and University of Oregon for useful comments. Janybek Abakirov, Brad Beall, Freddie Leonardi, and Brent Asavamonchai provided excellent research assistance.

* Please direct all correspondence to: Betty J. Simkins, Department of Finance, College of Business Administration, Oklahoma State University, Stillwater, OK 74078-4011, (405) 744-8625 (office), (405) 744-5180 (fax), email: simkins@okstate.edu.

Does Fuel Hedging Make Economic Sense? The Case of the US Airline Industry

Abstract

Does hedging add value to the firm, and if so, is the source of the added value consistent with hedging theory? We investigate jet fuel hedging behavior of firms in the US airline industry during 1994-2000 to examine whether such hedging is a source of value for these companies. We illustrate that the investment climate in the airline industry conforms well to the theoretic framework of Froot, Scharfstein, and Stein (1993). In general, airline industry investment opportunities correlate positively with jet fuel costs, while higher fuel costs are consistent with lower cash flow. Given that jet fuel costs are hedgeable, airlines with a desire for expansion may find value in hedging future purchases of jet fuel. Our results show that jet fuel hedging is positively related to airline firm value. The coefficients on the hedging indicator variables in our regression analysis suggest that the “hedging premium” constitutes approximately a 12-16 percent increase in firm value. We find that the positive relation between hedging and value increases in capital investment. This result is consistent with the assertion that the principal benefit of jet fuel hedging by airlines comes from reduction of underinvestment costs.

JEL Classification: G30, G31, G32, L93

Keywords: Hedging; Risk Management; Airline industry

I. Introduction

Recent literature in corporate finance has fostered an improved understanding of why nonfinancial firms may hedge.¹ However, very little research has focused on whether hedging achieves reasonable economic objectives. In particular, many researchers are interested in whether hedging increases firm value. Allayannis and Weston (2001) examine the relation between foreign currency hedging and Tobin’s Q. They conclude that hedging is associated with higher firm value.

¹ Allayannis and Ofek (2001), Berkman and Bradbury (1996), Dolde (1995), Gay and Nam (1998), Géczy, Minton, and Schrand (1997), Graham and Rogers (2002), Haushalter (2000), Mian (1996), Nance, Smith, and Smithson (1993), Rogers (2002), Schrand and Unal (1998), and Tufano (1996) are many of the published studies examining the determinants of corporate hedging behavior.

One obvious question resulting from the results of Allayannis and Weston (2001) pertains to the source of value from hedging. They speculate that the source of added value from hedging is likely attributable to its ability to reduce underinvestment as theorized by Bessembinder (1991) and Froot, Scharfstein, and Stein (1993). Unfortunately, their study is unable to draw this specific conclusion.

In this paper, we study the dual questions of “does hedging add value?” and “if so, what is the source of added value?” To do so, we identify a more targeted sample than used by Allayannis and Weston (2001). We analyze hedging of jet fuel price risk exposure by US airlines. Because average jet fuel costs constitute approximately 13 percent, on average, of airlines’ operating costs, jet fuel price risk is economically meaningful to airlines.

In addressing the value question, we adopt a similar framework to Allayannis and Weston (2001). The results show that airlines increase value by hedging their jet fuel price exposures. Additionally, changes in hedging are positively associated with changes in firm value. As in Allayannis and Weston, we interpret certain results from our regressions as the “hedging premium” (i.e., the added firm value attributable to hedging). Our results suggest that the average hedging premium for airlines is in the range of 12-16 percent.

The airline sample allows us to also address the source of value question. We find that the airline industry exhibits two characteristics consistent with the general assumptions and framework developed in Froot et al. (1993). First, the airline industry’s history of investment spending is not negatively correlated with jet fuel costs, as one might expect. In fact, the relation between these two variables is largely positive. Second, airlines face significant distress costs, as shown by Pulvino (1998, 1999), because distressed airlines are forced to sell aircraft at below-market prices. Froot et al. (1993) suggest that firms facing significant expected distress costs will choose to underinvest. In essence, the underinvestment cost is an indirect cost of financial