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Fuel Cost Hedging in the U.S. Airline Industry

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IN THE U.S. AIRLINE INDUSTRY

By

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Honors in Accounting and Finance

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Abstract

The purpose of this thesis is to focus on the effect of the jet fuel hedging on the airline company's profit. Some specific questions will be "who does jet fuel hedging in the U.S. airline industry?' and "How does jet fuel hedging work or effect on the airline company's profit?" To apply these questions into the real world, this thesis will present an analysis of four U.S. based airline companies' latest annual reports, and thereafter, to find out the relationship between the jet fuel hedging strategy and the company's profit and to observe the percentage of operating cost that airline company usually hedge. The four airlines that been selected are Southwest Airlines, Delta Air Lines, US Airways, and American Airlines.

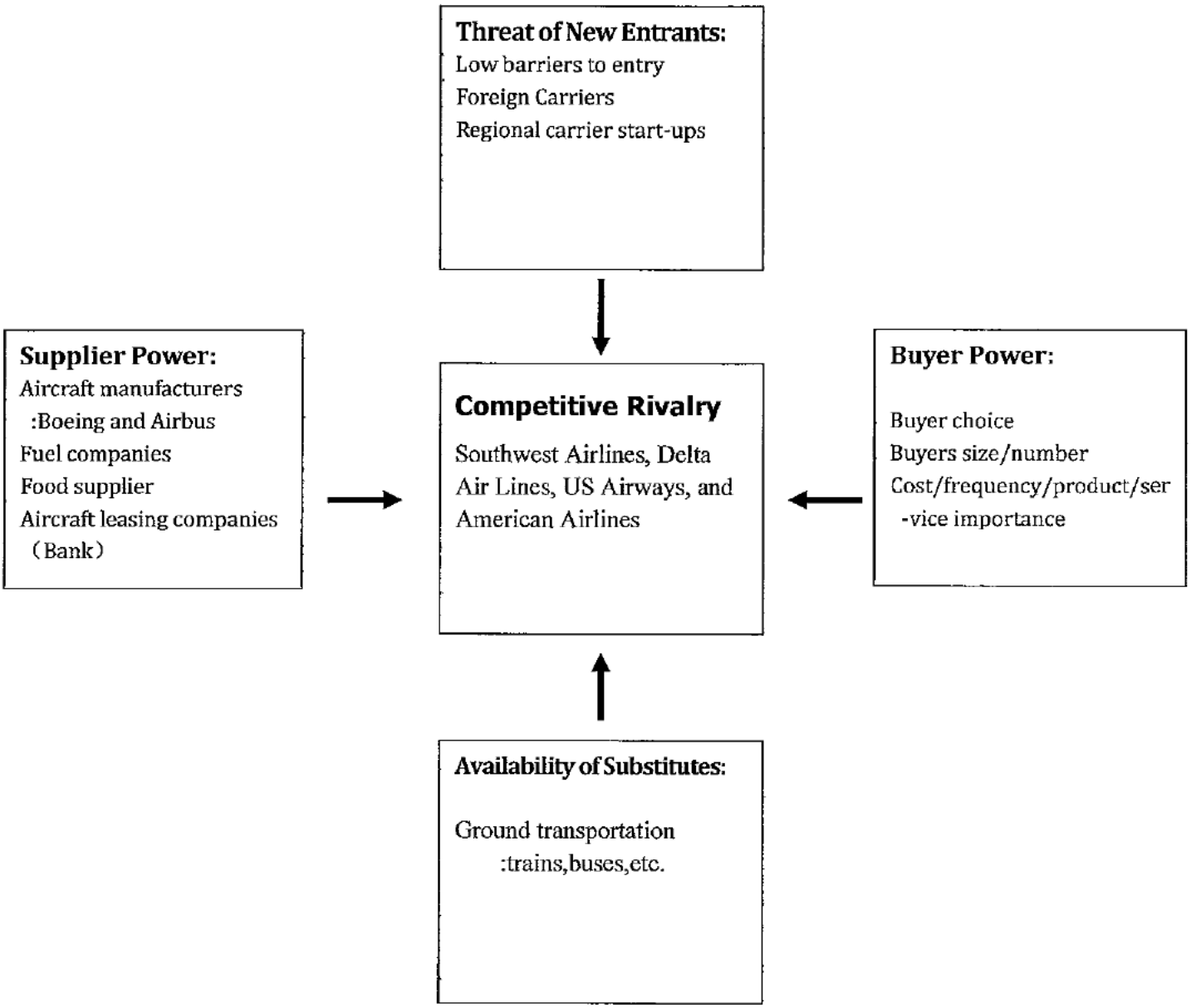
Introduction

Jet fuel costs account for a large portion of an airline's operating expenses, according to the Air Transportation Association (ATA). Fuel cost is an airline's second largest expense after the labor cost and on average it constitutes approximately 13 percent of airline company costs. Hence, jet fuel price risk is economically meaningful to airlines. In addition, due to the highly intensive competition environment of the airline industry, airline companies cannot pass all of the jet fuel costs on to their customers when fuel prices rise dramatically (refer to appendix 1 The volatility of jet fuel price). As a result, most airline companies adopt jet fuel hedging strategy and believe it can protect companies' profit from the unstable fuel price. A good example will be the low-cost airlines such as Southwest that have benefited considerably from an aggressive hedging strategy. However, other airline companies, for example, Delta, claimed that risk would be present regardless of whether they hedged or not.

In order to get a better understanding of fuel hedging strategy, the reasons of jet fuel hedging instruments' implementation will be explored. This paper will be structured as follows: Section I provides an industry analysis to further prove the unfavorable current industry situation for the existing airlines. Section II provides the answer for the questions like what fuel hedging is, how it works, and why airlines hedge. Section III illustrates some major instruments of jet fuel hedging, and Section IV investigates four major airlines' jet fuel hedging positions.

Section I: Airline Industry analysis

1.1 Port's five forces



Threat of New Entrants: The airline industry is a business which requires huge setup costs and large investments. It seems like this industry is quite tough to break into, but today banks have increased possibilities of new entrants through offering long term

loans on less interest to business sectors. If borrowing is cheap, then the likelihood of more airlines entering the industry is higher. Obviously, the threat of new entrants for the existing airlines is increased.

Power of Suppliers: The airline supply business is mainly dominated by Boeing and Airbus. For this reason, Boeing and Airbus have high bargaining power due to large switching costs associated with changing airplanes.

Power of Buyers: Customers have some bargaining power in the domestic airlines industry because of the high competition among airline companies. However, there are high costs involved with switching airplanes, and the quality of each airline company in terms to compete on service is almost equal. This gives the airlines an inability to offset the bargaining power of buyer effectively.

Availability of Substitutes: Substitutes to air travel include cars, buses, and trains. For domestic airlines, the threat might be a little higher than international carriers. Considering domestic airlines, there are options available to the customers like ground transportation but time consumption and convenience are the factors that discourage customers to adopt any one of these substitutes. Cost of air travel however is another barrier that let customers to consider other available options, but this reason is becoming of less concern because of the fairly low switching costs between air travel and its substitutes (the high competition in the airline industry result in a price war among the airline companies). International carriers have very less or no threat regarding other options.

Competitive Rivalry: Rivalry exists in the airline industry and is intense because there are several airlines operating on the same destinations around the world. They compete aggressively with each other through offering different services, lowering prices, frequent flyer membership privileges and other benefits to grab more customers than their competitors.

1.2. Industry current situation

Porter's Five Forces model helps paint a picture of the airline industry. The depressive market situation of the industry has become obvious through intense price wars, strong supplier bargaining power, and high threat from new entrants. Highly competitive industries generally earn low returns because the cost of competition is high. Therefore, airline companies are struggling to find a way to control costs and lower it to a certain extent as much as possible. It turns out that most airlines are striving to lower their operating cost by doing something the industry calls "hedging" to protect the second largest expense for airlines, the fuel costs.

Section II: Fundamental theory of hedging

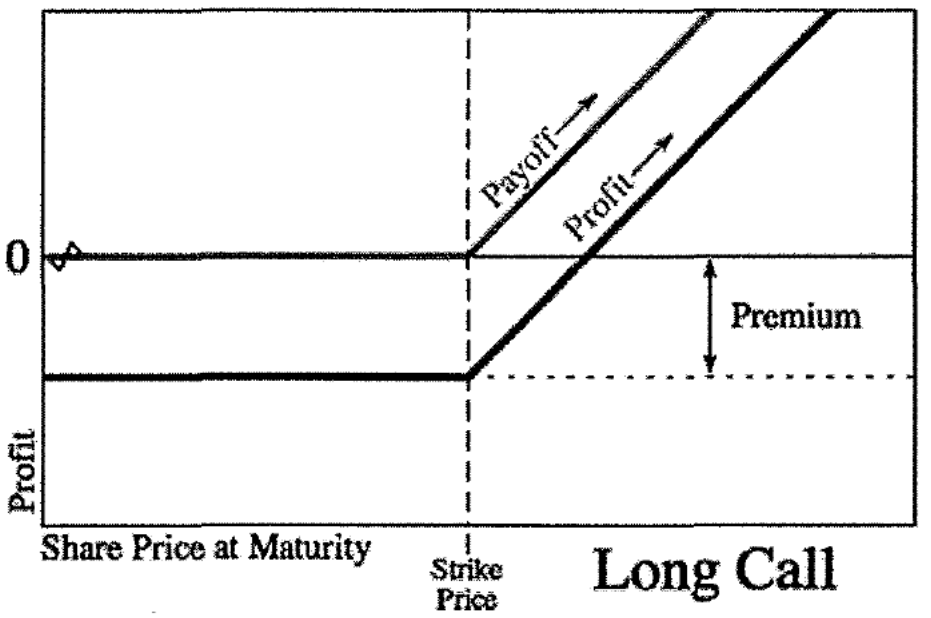
2.1 What is fuel hedging

Fuel hedging is a contractual tool for some large fuel consuming companies, such as airline companies, to lock in the cost of future fuel purchases. In the airline industry, airline companies enter into hedging contracts to reduce their exposure to future fuel prices changes, which may be higher than current prices, and to set a known fuel cost for budgeting purposes. There are several instruments that the company can use to hedge, and different combination of these instruments can produce different results of hedging. In section III, we will provide more detail of some major hedge instruments in the airline industry, but let's see one common example of these instruments to start an understanding of fuel hedging.

If the airline company buys a fuel call option at $40 per barrel and the price of fuel increases to $45, the company will receive a return on the option that offsets their actual cost of fuel. On the other hand, if the price of fuel decreases to $35, the company will not receive a return on the option but they will benefit from having the right to not exercise the option and buying fuel at the then lower cost (call options are only obligation for the sellers).

Call premium	$2
Strick price	$40
Spot price	$35 or $45

Today		Expration		
			St=35	St=45
		Buy the Oil	-St=35	-St=45
Buy call	-2	Own call	Max[0, St-40]=0	Max[0, St-40]=(45-40)
		Payoff	-St=35	-40
		Profit	-35-2=-34	-40-2=-42



From the table and graph showed above, we can simply observe that this airline locked the fuel price at $42 against the potential of price increase and can still enjoy the benefits by following the spot price when it drops lower than the strike price. This protects against sudden losses from rising fuel prices, and stabilizes fuel cost overall across airline costs.

2.2 What fuel hedging does

One important topic of this paper is to illustrate why airlines hedge. The earlier example in this paper may provide a clue for the reason of hedging, that is, hedging stabilize fuel prices and therefore overall costs, cash flows, and profits. The theory behind airline fuel hedges is to reduce a major source of swings in profits, and thus higher prices for the airlines' stocks. The variability of jet fuel price has high correlation with airlines stock price for two reasons: first, based

on the five forces analysis that we did earlier in this paper, travel demand is sensitive to consumer confidence, which is highly correlated with stock market performance; second, airlines themselves are highly leveraged, in the sense that the total value of outstanding stock is a small portion of the company's annual incomes. Small changes in profits make for large changes in the return to stock shares. Therefore, most traded airlines today hedge fuel costs.

2.3 How does fuel hedging effect on profit

For airlines, fluctuation of jet fuel is not easy to predict or to control, and the profit of airlines is hugely affected by the rise or fall of the jet fuel. As the intrinsic theory behind the jet fuel hedging implied, airlines want to increase the value of the shareholders by reducing the risk of fuel price variability. However, the question remains on how jet fuel hedging works. Here, three general incentives of these airlines that do hedge jet fuel price are stated as follow:

1. If airlines do not enter into any agreement that fix the price of jet fuel over any period of time, an increase in the cost of jet fuel will be immediately passed through to the airlines by suppliers. Recall from the industry analysis, the airline cannot pass the stress of increased jet fuel price to the passengers because of the high competition in the airline industry. Therefore, the airlines will experience reduced margins because they are unable to increase fares to compensate for such higher fuel costs. In addition, it is impossible for an airline to stock large

amounts of jet fuel, due to financing and storage costs. Hence, an effective strategy for airlines is to hedge fuel costs to avoid huge swings in expenses.

2. One may argue that average profitability over the years will be the same whether the variability in the cost is large or small. It is true when there is no other systemic influence such as tax liabilities to the earnings. From the accounting perspective, the corporate tax liabilities may have a positive influence on the earnings, but it is actually a side effect to the value of the company's shareholder. Which means the more the variability in earnings, the less the average value of the firm (Song, 2006). Therefore, managers would choose to implement hedging against the variability of the cost because of the systemic effect of corporate tax liability. It is a matter of course to implement hedging instruments when the cost of hedges is smaller than the benefit.

3. From another aspect, by reducing the volatility of earning, thereby reducing the chance of financial distress, hedging increases debt capacity. Since the cost of equity decreases by the decrease in the risk premium, the firm can increase debt to keep the cost of capital at the same or at a lower level. If debt increases in response to the greater debt capacity, the associated increase in interest deductions reduces tax liabilities and therefore increases the firm value. Thus the ability to increase debt capacity provides an additional tax incentive to hedge.

Section III: Fuel hedging in the airline Industry

3.1. Fuel Hedging instruments by airlines

This section describes the most commonly used hedging contracts by airlines: futures contracts and forwards contracts, call options (including caps), collars (including zero-cost and premium collars), and swap contracts. At the beginning of this paper, an example of hedging with call options was given. In practice, fuel price risk can be managed in a number of ways:

Futures and Forward Contracts

A futures contract is an agreement to buy or sell a specified quantity and quality of a commodity for a certain price at a designated time in the future. The buyers have a long position, which means buyers agree to buy the underlying assets. The sellers have a short position, which means sellers agree to sell the underlying assets. Futures contracts are traded on an exchange, which specifies the contracts in term of quantity, quality, and delivery time and guarantees their performance. Only a small percentage of futures contracts traded result in delivery of the underlying assets. Instead, buyers and sellers of futures contracts generally offset their position.

A forward contract is the same as a futures contract except for two important distinctions: (1) Futures contracts are standardized and traded on exchanges, whereas forward contracts are typically customized and not traded on an exchange; and (2) Futures contracts are daily based marking to market

transaction, whereas forward contracts are settled at maturity only. For the futures contract, marking to market daily transaction means that each day during the life of the contract, there is a daily cash settlement depending on the current value of the underlying assets being hedged.

Call Options (Caps)

A call option is the right to buy a particular underlying asset at a predetermined fixed price (the strike price) at a predetermined date. OTC options in the oil industry are usually cash settled, while exchange-traded oil options on the NYMEX have physical settlement. Their settlement is normally based on the average price for a period, commonly a month. Airlines like settlement against average prices because an airline usually refuels its aircraft several times a day. Since the airline is effectively paying an average price over the month, they usually prefer to settle hedges against an average price, which are called average price options.

Another way to implement options is to to hedge cross-market risks. For example, in the airline industry, an airline could buy an option on crude oil as a cross-market hedge against a rise in the price of jet fuel. Of course, cross-market hedges should only be used if the prices are highly correlated.

Airlines value the flexibility that fuel options provide, but fuel options can be seen as expensive relative to other options. The reason is the high volatility of oil commodities, which causes the option to have a higher premium. For this reason, collars, which will be discussed next, are often used.

Collars

A collar is a combination of a put option and a call option. For a hedger who is planning to purchase an underlying asset with a collar, they need to sell a put option with a strike price below the current underlying asset price and buy a call option with a strike price higher than the current underlying asset price. The call protects the hedger from adverse price increases above its strike price, while selling a put option limits the advantage it can take of price reductions below its strike price. However, more and more airlines have moved toward using this combination of a call and a put option because the total cost of taking the two options is the call option premium paid less the put option premium received, and the premium received from selling the put option helps offset the cost of the call option.

The implement of collar helps airlines to lock in the price that will be paid for fuel between two known values. Therefore, a collar can limit the risk to a small range of price moves. In addition, the cost of efficiency of this hedging instrument is improved by offsetting two options premium.

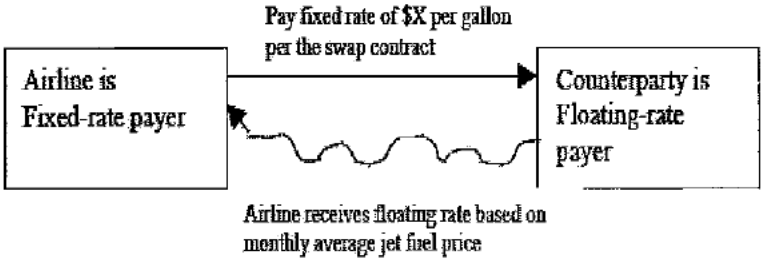
Premium collar: If the increase of underlying asset price is more concerned, the hedger will buy a call option with lower strike price. On the contrary, if more benefit from declining prices is desired, the hedger will sell a put with a lower strike price. With a premium collar, the cost of the call option is only partially offset by the premium received from selling a put option. Later at the end of this

section, a descriptive graph will be provided to compare the premium collar strategy with other strategy.

SWAP

SWAP is an agreement whereby a floating price is exchanged for a fixed price over a certain period of time. It is an off-balance-sheet financial arrangement, which involves no transfer of the physical item. Both parties settle their contractual obligations by means of a transfer of cash. In a fuel swap, the swap contract specifies the volume of fuel, the maturity of the swap, and the fixed and floating prices for fuel. The differences between fixed and floating prices are settled in cash for specific periods. At the time the contract matured, if the spot price exceeds the strike price, the counter-party would pay the airline the difference times the amount of fuel. However, if the spot price were lower, then the airline would pay the difference. The figure below illustrates fuel hedging with a swap contracts graphically.

Fuel Hedging Using Swap Contracts

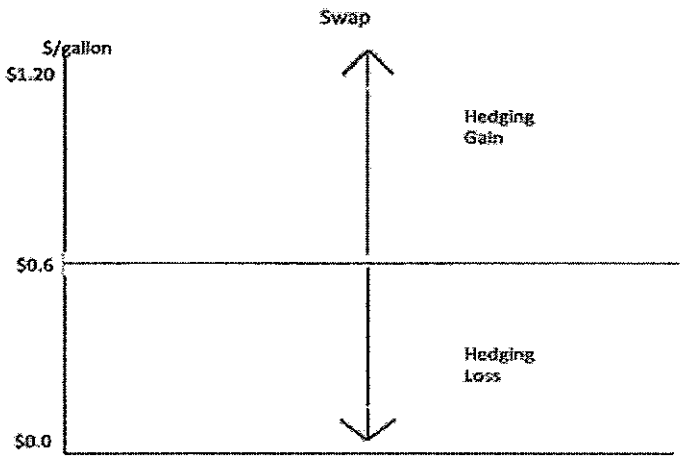


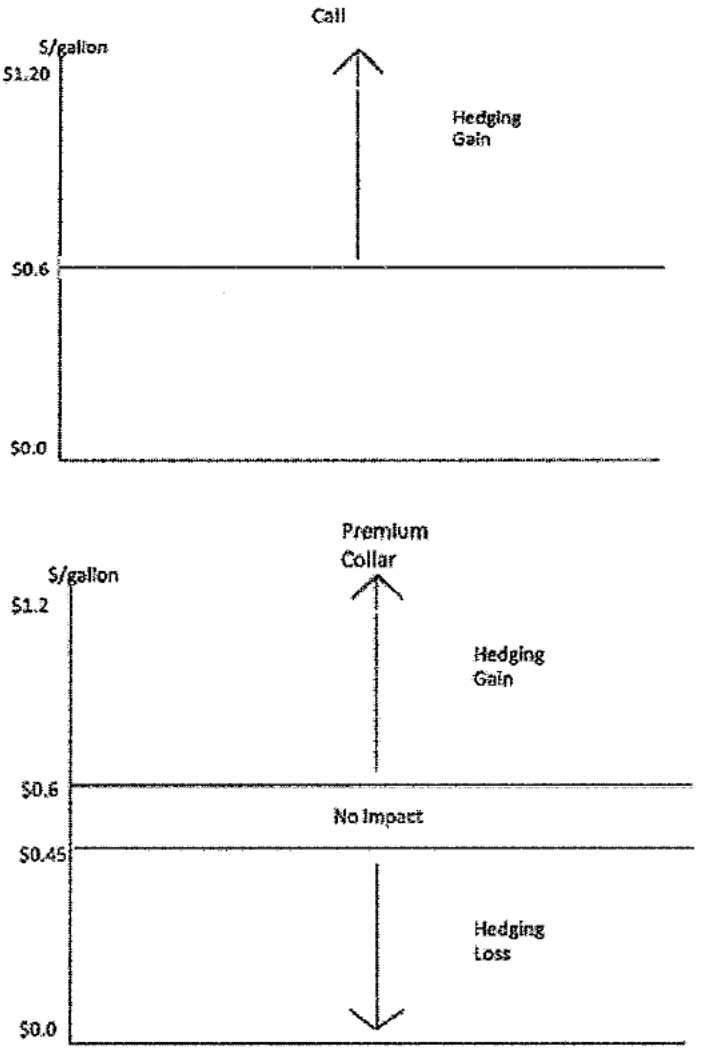
In summary, jet fuel itself can only be hedged through over-the-counter arrangements with the additional counter-party risk. Hedging oil on exchanges such as NYMEX that regulate standardized contracts eliminates counter-party risk. These also are more liquid, and allow an airline to sell before the due date. For longer periods into the future only crude oil instruments have good liquidity. Jet fuel contracts only have liquidity for shorter periods.

The graph below provides a conceptual illustration for hedging gains or losses using swap, call options, and premium collars when locking into a 60-cents/gallon price of jet fuel.

Swap, Call option, Premium Collar

(Examples of hedging at 60 cents/gallon)

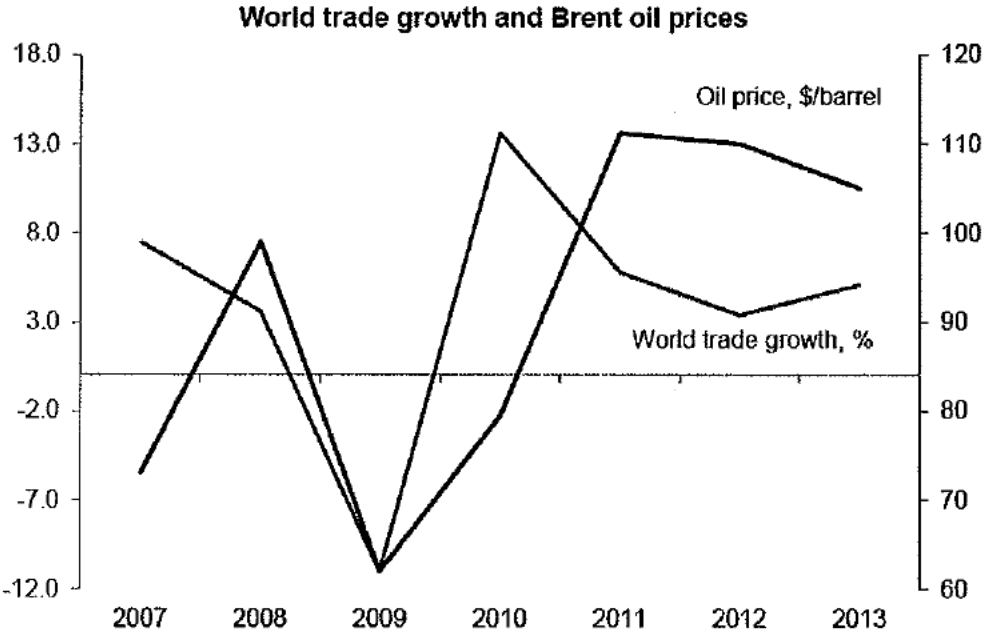




3.2 Trends of fuel hedging in the industry

As jet fuel prices are rising, there are signs that point toward an upward trend for airlines to enhance their hedging positions. According to International Air Transport Association (IATA) fuel consulting, the airline industry profitability has been experiencing significant downward pressure in 2011 and

2012. The reason for that is the increased profile of oil prices and dramatically decreased world trade growth (refer to the figure below).



Source from IATA Industry financial Forecast Report

Oil price rose from $79 a barrel in 2010 to an average of $110 in 2012, or $127.7 a barrel for jet fuel. The global airline industry is expected to spend $207 billion in 2012 (refer to the Table 1 below), which means that roughly 33% of airlines expenses will be allocated to fuel alone. This is an increase of $31 billion over 2011 and is almost 5 times the year 2003's fuel expenses of $44 billion (refer to the Table 2 below).

TABLE1 Fuel impact on operating expense

Fuel Impact on Operating Costs

Year	% of Operating Costs	Average Price per Barrel of Crude	Break-even Price per Barrel	Total Fuel Cost
2003	14%	$28.8	$23.4	$44 billion
2004	17%	$38.3	$34.5	$65 billion
2005	22%	$54.5	$51.8	$91 billion
2006	26%	$65.1	$68.3	$117 billion
2007	28%	$73.0	$82.2	$135 billion
2008	33%	$99.0	$82.5	$189 billion
2009	26%	$62.0	$58.9	$125 billion
2010	26%	$79.4	$89.6	$139 billion
2011 F	30%	$111.2	$116.1	$176 billion
2012 F	33%	$110.0	$111.9	$207 billion

Source from IATA Industry financial Forecast Report

TABLE 2 Industry selected financial data

System-wide global commercial airlines	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012F	2013F
										Central forecast	
REVENUES, $ billion	322	379	413	465	510	570	476	547	597	636	660
% change	5.2	17.7	9.1	12.5	9.6	11.7	-16.5	14.9	9.3	6.4	3.9
Passenger	249	294	323	365	399	444	374	425	468	505	528
Cargo	40	47	48	53	59	63	48	66	69	68	68
Traffic volumes											
Passenger growth, tkp, %	2.3	14.9	7.0	5.0	6.4	1.5	-2.1	7.3	5.9	5.3	4.5
Sched passenger numbers, millions	1,776	1,982	2,123	2,233	2,418	2,485	2,479	2,681	2,830	2,973	3,101
Cargo growth, tkp, %	3.9	7.9	0.4	4.8	4.8	-1.0	-9.8	18.7	-0.7	-0.4	2.4
Freight tonnes, millions	33.5	36.7	37.6	40.0	42.0	41.0	40.7	48.0	47.6	47.3	48.3
World economic growth, %	2.8	4.2	3.4	4.0	3.8	1.7	-2.3	3.9	2.5	2.1	2.5
Passenger yield, %	2.4	2.6	2.7	7.8	2.7	9.5	-14.0	6.1	4.0	2.5	0.0
Cargo yield %	2.0	7.4	2.4	5.9	5.5	7.4	-14.2	15.0	5.5	-2.0	-1.5
EXPENSES, $ billion	323	376	409	450	490	571	474	525	580	626	643
% change	4.0	16.2	8.9	10.1	8.8	16.5	-16.9	10.7	10.6	7.8	2.7
Fuel	44	65	91	117	135	189	125	139	176	208	208
% of expenses	14	17	22	26	28	33	26	26	30	33	32
Crude oil price, Brent, $/b	28.8	38.3	54.5	65.1	73.0	99.0	62.0	79.4	111.2	110.0	105.0
Jet kerosene price, $/b	34.7	49.7	71.0	81.9	90.0	126.7	71.1	91.4	127.5	127.7	122.9
Non-Fuel	279	311	318	333	355	382	349	386	404	418	434
cents per atk (non-fuel unit cost)	38.9	39.5	38.6	38.9	39.3	41.8	39.6	41.6	41.4	41.4	41.4
% change	0.3	1.4	-2.1	0.8	0.8	6.4	-5.2	5.1	-0.5	0.0	0.0
Break-even weight load factor, %	61.1	61.9	62.0	61.2	60.9	63.2	62.3	63.1	63.0	64.1	63.4
Weight load factor achieved, %	60.8	62.5	62.6	63.3	63.4	63.1	62.6	65.7	64.9	65.1	65.1
Passenger load factor achieved, %	71.5	73.4	74.9	76.1	77.7	76.0	76.0	78.4	78.3	79.2	79.3
OPERATING PROFIT, $ billion	-1.4	3.3	4.4	15.0	19.9	-1.1	1.9	21.7	17.0	9.9	17.3
% margin	-0.4	0.9	1.1	3.2	3.9	-0.2	0.4	4.0	2.9	1.6	2.6

Source: ICAO data to 2009-11.IATA forecasts for 2012 and 2013.

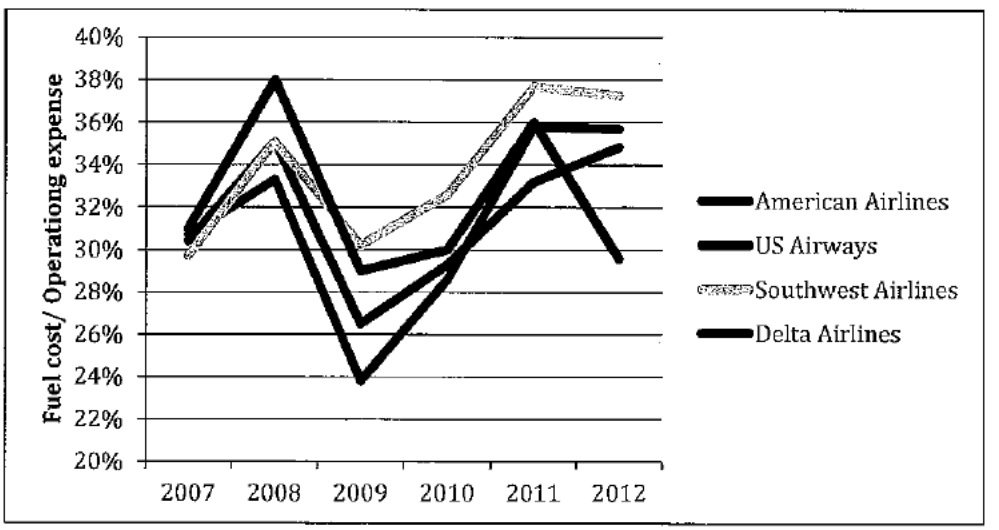
Comparing the jet fuel cost with the total operating expense in the industry, the percentage of 14% in 2003 increases to 30% in 2011, and it will continuously rise in the subsequent two years. More and more airlines realize that this is an unnecessary financial and environmental waste that can only get worse as fuel prices increase and carbon emissions are taxed. Therefore, a trend back to hedging is a matter of course.

Section IV: Sample airline company analysis

In the article, "Does Fuel Hedging Make Economic Sense?," Carter and Rogers indicated that airlines typically hedge between one and two thirds of their expected fuel costs in the U.S. industry. Most airlines look forward six months in their hedging. Few hedges are forward more that a year out. In this section, we select four airlines as samples to analyze and observe their jet fuel hedging position in the most recent six years. The four airlines are American Airlines, U.S. Airways, Southwest Airlines and Delta Airlines.

4.1 Fuel Costs and Operation of Airlines

As discussed above, fuel costs represents a large portion of the operation expense in an airline. Figure 1 shows four airlines' jet fuel costs to operation expenses ratio from 2007 to 2012. Since Q4 of 2012 has not been disclosed to SEC filings, data of nine months ended September 30 (Q1-Q3) of 2012 was used for the calculation.



	2007	2008	2009	2010	2011	2012
American Airlines	30.40%	35.10%	26.50%	29.30%	33.20%	34.84%
US Airways	30.70%	33.30%	23.80%	28.60%	35.80%	35.68%
Southwest Airlines	29.70%	35.10%	30.20%	32.60%	37.70%	37%
Delta Airlines	31%	38%	29%	30%	36%	30%

Figure 1. Fuel Costs to Operation Expense of Airlines (SEC Filngs)

Figure 1 also shows an upward trend of the jet fuel costs over the airlines' operation expenses. Among many possible reason for this trend, increasing jet fuel costs seem to be the most influential.

4.2 Impact of Hedging

For further analysis of the percentage that airlines typically hedged for fuel, the tables below provide some supportive data.

Table 1. Airline's Operating Income and [Hedge Gain or loss] (USD, million) (SEC Filngs)

	2007	2008	2009	2010	2011	2012*
American Airlines	965	(1,889)	(1,004)	308	(1,054)	104
	[239]	[380]	[651]	[-142]	[335]	[10]
US Airways	533	(1,800)	118	781	426	731
	[245]	[-356]	[-7]	[0]	[0]	[0]
Southwest Airlines	791	449	262	988	693	532
	[360]	[-19]	[-408]	[-426]	[-259]	[-87]
Delta Airlines	796	(8,314)	(324)	2,217	1,975	1,824
	[51]	[-65]	[-1.4]	[-89]	[420]	[-106]

* data of nine months ended September 30 (Q1-Q3), 2012

As Table 1 shows, hedging instruments are double-edged swords. Due to the volatility of jet fuel price, it is impracticable for airlines to always gain from their hedging. Also, the zero gain or loss for US Airways from 2010 to 2012 is because

they had not entered into any new transactions to hedge their fuel consumption since the third quarter of 2008 (refer to the appendix 2 Disclosure of Airlines' fuel hedging data).

Based on the hedge gain or loss for each airline, Table 2 indicated the difference of the fuel cost before and after hedges（refer to the appendix 2 & 3 Disclosure of Airlines' fuel hedging data）.

Table 2. Fuel cost before and after hedges

Fuel cost after hedges (millions)

	2007	2008	2009	2010	2011	2012*
American Airlines	6,670	9,014	5,553	6,400	8,304	6,555
US Airways	2,630	3,618	1,863	2,403	3,400	2,659
Southwest Airlines	2,690	3,713	3,044	3,620	5,644	4,615
Delta Airlines	5,676	8,686	8,291	8,901	11,783	7,759

Fuel cost before hedges (millions)

	2007	2008	2009	2010	2011	2012*
American Airlines	6,909	9,394	4,902	6,258	8,639	6,565
US Airways	2,875	3,262	1,856	2,403	3,400	2,659
Southwest Airlines	2,330	3,694	2,636	3,194	5,385	4,528
Delta Airlines	5,727	8,621	8,290	8,812	12,203	7,653

Total operating expense (millions)

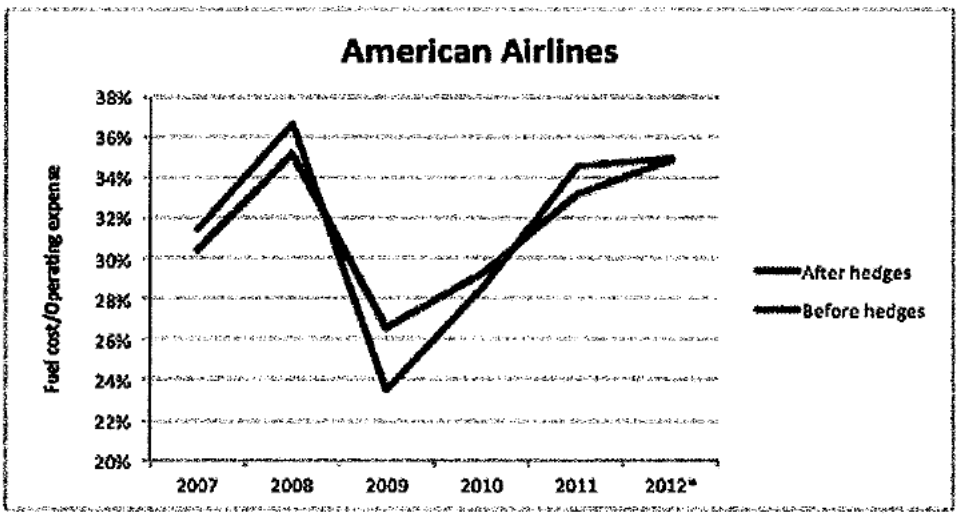
	2007	2008	2009	2010	2011	2012*
American Airlines	21,970	25,655	20,921	21,862	25,033	18,814
US Airways	11,167	13,918	10,340	11,127	12,629	9,822
Southwest Airlines	9,070	10,574	10,088	11,116	14,965	12,383
Delta Airlines	12,562	31,011	28,387	29,538	33,140	26,244

* data of nine months ended September 30 (Q1-Q3), 2012

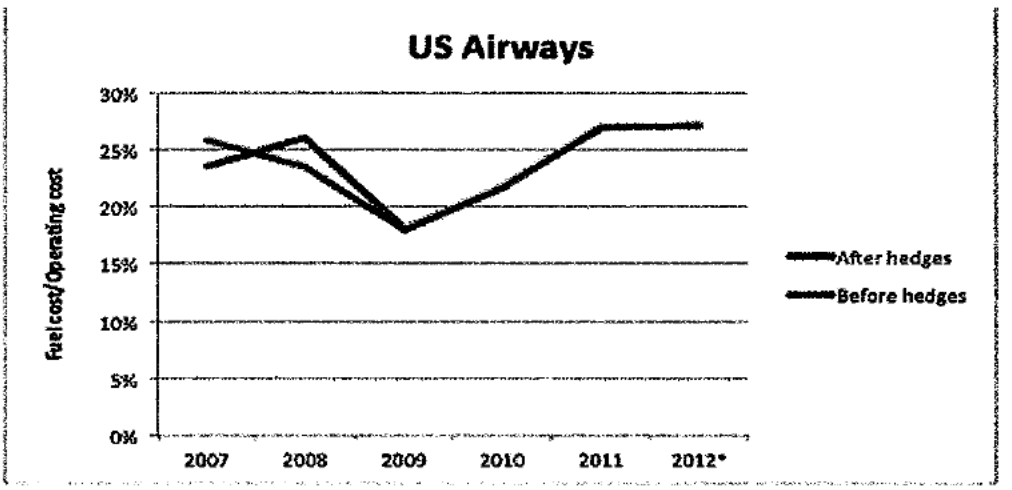
In Table 2, jet fuel costs reflect adjustment of gain or loss from using hedging instruments. Among the four airlines studied, each airline has its own long-term or short-term fuel-hedging plan. Here, Figure 2 shows each airline's jet fuel costs

to operation expenses ratio before and after adjustment of its fuel hedges.

Figure 2. Airline's Jet Fuel Costs to Operation Expenses Before and After Hedge Gain (SEC Filings)

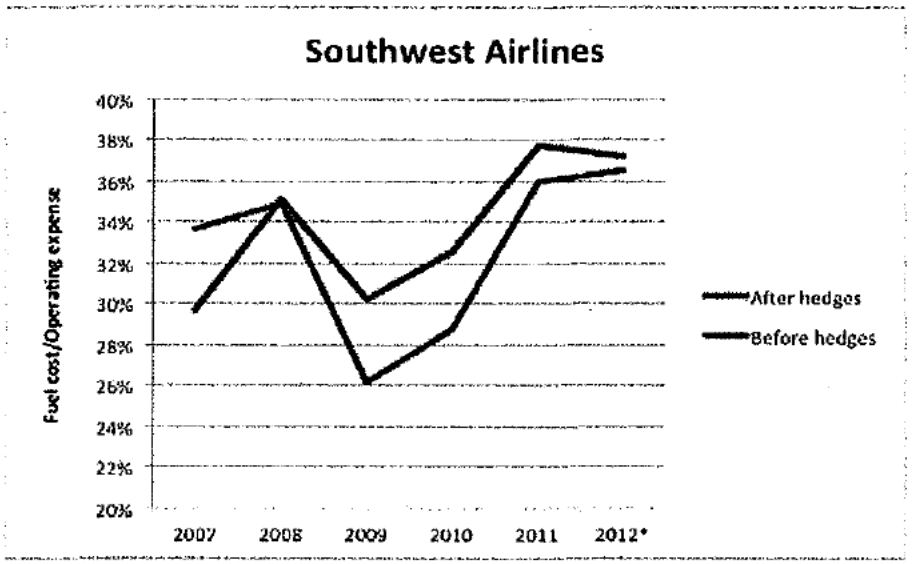


	2007	2008	2009	2010	2011	2012*
After hedges	30.36%	35.14%	26.54%	29.27%	33.17%	34.84%
Before hedges	31.45%	36.62%	23.43%	28.63%	34.61%	34.89%

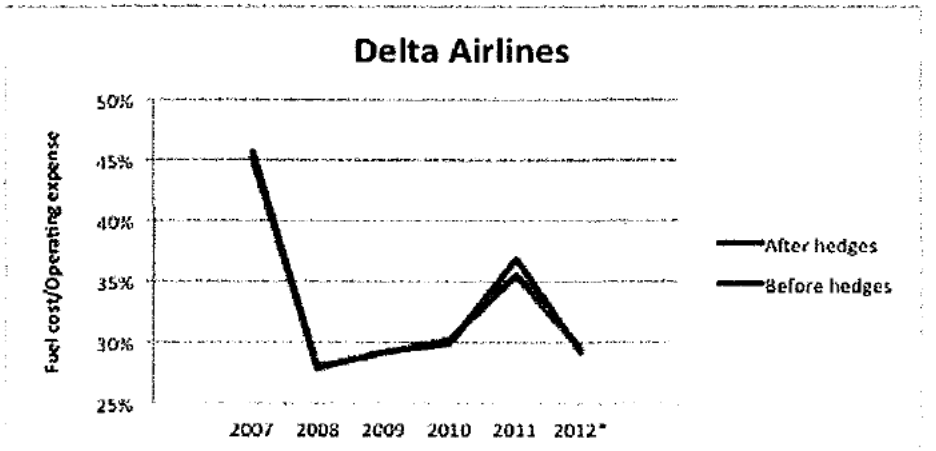


	2007	2008	2009	2010	2011	2012*
After hedges	23.55%	26.00%	18.02%	21.60%	26.92%	27.07%
Before hedges	25.75%	23.44%	17.95%	21.60%	26.92%	27.07%

Figure 3. Airline's Jet Fuel Costs to Operation Expenses Before and After Hedge Gain (SEC Filngs) continued.



	2007	2008	2009	2010	2011	2012*
After hedges	29.66%	35.11%	30.17%	32.57%	37.71%	37.27%
Before hedges	33.63%	34.93%	26.13%	28.73%	35.98%	36.57%



	2007	2008	2009	2010	2011	2012*
After hedges	45.18%	28.01%	29.21%	30.13%	35.56%	29.56%
Before hedges	45.59%	27.80%	29.20%	29.83%	36.82%	29.16%

In Figure 2, we can see that Southwest was the only one that maintained aggressive long-term fuel hedging, As shown in Table 1, except year 2009 and 2010, it will not be an exaggeration to say that hedge gain contributes the most portion of Southwest airlines' operating income. For the other three airlines, they may not benefit from hedging as much as Southwest did. But it cannot be denied that hedging balanced, more or less, the side effect of the volatile jet fuel price on the operating expense.

4.3 Hedge position

The table below shows the historical data (2009-2012) of the four airlines hedge position. The percentages represent the volume that each airline hedged. These percentages are depending on each airline's estimated fuel requirement of the next year.

Table 3. Fuel hedge positions of selected airlines

	2009	2010	2011	2012
American Airlines	35%	24%	35%	21%
US Airways	0%	0%	0%	0%
Southwest Airlines	10%	50%	40%	38%
Delta Airlines	9%	24%	38%	2%

As shown in Table 3, since the third quarter of 2008, US Airways have not entered into any new transactions to hedge their fuel consumption, and they

have not had any fuel hedging contracts remaining since the third quarter of 2009; they didn't hold any fuel hedge position in the past 4 years. For the other three selected airlines, American Airlines' average hedge position is 28.75%, Southwest Airlines is as aggressive as usual, holding a 34.5% (on average) of its estimated fuel consumption of next year, and Delta Airlines has a average percentage of 18.25%.

In summary, the analysis of the four airlines' fuel cost and their different hedging strategies indicated that hedge instruments are not used to earn more money; to be more specific, they are used to smooth out year to year's earnings, and benefit from predictable and stable jet fuel prices, and by doing so they can create value to the firms. To be an effective hedger, the company should set up an effective hedging assumption and continuously improve the assumption.

Conclusion

Fuel prices continue to present one of the industry's most significant challenges, as the cost of fuel has been at historically high levels over the last few years and has been unpredictable, and as airlines are inherently dependent upon energy to operate, a small change in market fuel prices can significantly affect airlines' profitability. For that reason, airlines face an incentive to hedge fuel price risk. By using the hedging instruments like forward or future contract, options, collars, and swap, airlines can avoid huge swings in expenses.

Furthermore, our analysis of the four U.S. based airlines indicated that there is no such right answer for the question "how much should we hedge?" Different airlines have different hedging positions that depend on their own company situation and hedging policy. However, the historical financial data of these airlines implied that an airline might successfully hedge the fuel risk from the volatility of its price by maintaining a long-term and consistent hedging strategy.

References

Carter, D. A., Rogers, D. A., & Simkins, B. J. (May, 2003). *Does Fuel Hedging Make Economic Sense? The Case of the US Airline Industry.* Oklahoma State University; Portland State University .

Jin, Y., & Jorion, P., (July 2007). *Does Hedging Increase Firm Value? Evidence from the Gold Mining Industry.* University of California at Irvine; California State university.

Hull, J. C., (2000); *Futures, and Other Derivatives*, Prentice-Hall.

Nadeem, N., Mohammad P. K., & Mroso G. (2011) *VALUE OF HEDGING IN U.S. AIRLINE INDUSTRY: A Perspective on Firm Value and Accounting Performance.* Lund University

International Air Transport Association. *Annual Report 2011.* Singapore: 67th Annual General Meeting, 2011.

International Air Transport Association. *Annual Report 2012.* Beijing: 68th Annual General Meeting, 2012.

International Air Transport Association. *Industry Outlook Sep. 2012, Financial forecast.* www.iata.org/economics.

Widjajakusuma, R., Liao, C., Yin, J., & Lin, M. (June 2011) *Jet Fuel Hedging Analysis: Strategy analysis and Recommendation.* Portland State University.

Morrell, P., & Swan, W. (2006) *Airline Jet Fuel Hedging: Theory and Practice.* Department of Air Transport, Cranfield University.

Cobbs, R., & Wolf, A. (2005) *Jet Fuel Hedging Strategies: Options Available for Airlines and A Survey of Industry Practices.* Accessed on November 2009 at http://www.kellogg.northwestern.edu/research/fimrc/papers/jet_fuel.pdf

Carter, D. A., Rogers, D. A., & Simkins, B. J. (May, 2003). *Does Fuel Hedging Make Economic Sense? The Case of the Southwest Airlines.* Oklahoma State University; Portland State University .

USA TODAY/Money article, July 24, 2008; *Can fuel hedges keep Southwest in the money?*. http://usatoday30.usatoday.com/money/industries/travel/2008-07-23-southwest-jet-fuel_N.htm

Song, C. (2006) *HOW MUCH SHOULD WE USE DERIVATIVES HEDGES? A Study in Airline Industry.* Fordham University.

AMR Corporation. *10-Q report 2012.* SEC filing (2012).

AMR Corporation. *10-K report 2011.* SEC filing (2011).

AMR Corporation. *10-K report 2010.* SEC filing (2010).

AMR Corporation. *10-K report 2009.* SEC filing (2009).

US Airways Group, Inc. *10-Q report 2012.* SEC filing (2012).

US Airways Group, Inc. *10-K report 2011.* SEC filing (2011).

US Airways Group, Inc. *10-K report 2010.* SEC filing (2010).

US Airways Group, Inc. *10-K report 2009.* SEC filing (2009).

Southwest Airlines Co. *10-Q report 2012.* SEC filing (2012).

Southwest Airlines Co. *10-K report 2011.* SEC filing (2011).

Southwest Airlines Co. *10-K report 2010.* SEC filing (2010).

Southwest Airlines Co. *10-K report 2009.* SEC filing (2009).

DELTA AIR LINES, INC. *10-Q report 2012.* SEC filing (2012).

DELTA AIR LINES, INC. *10-K report 2011.* SEC filing (2011).

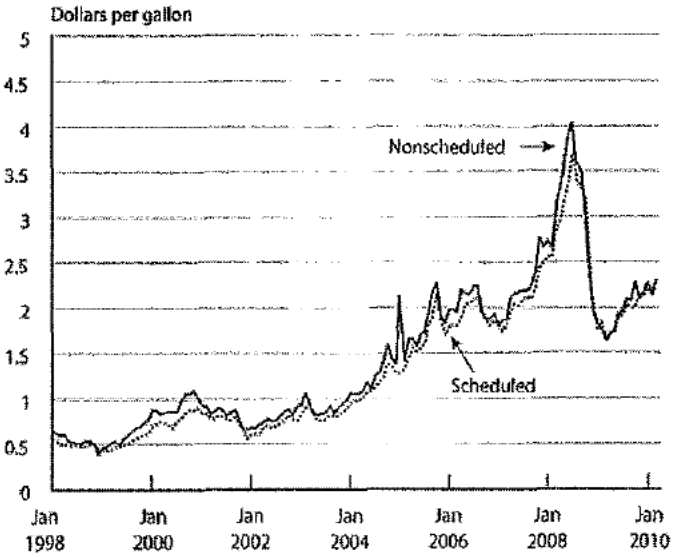
DELTA AIR LINES, INC. *10-K report 2010.* SEC filing (2010).

DELTA AIR LINES, INC. *10-K report 2009.* SEC filing (2009).

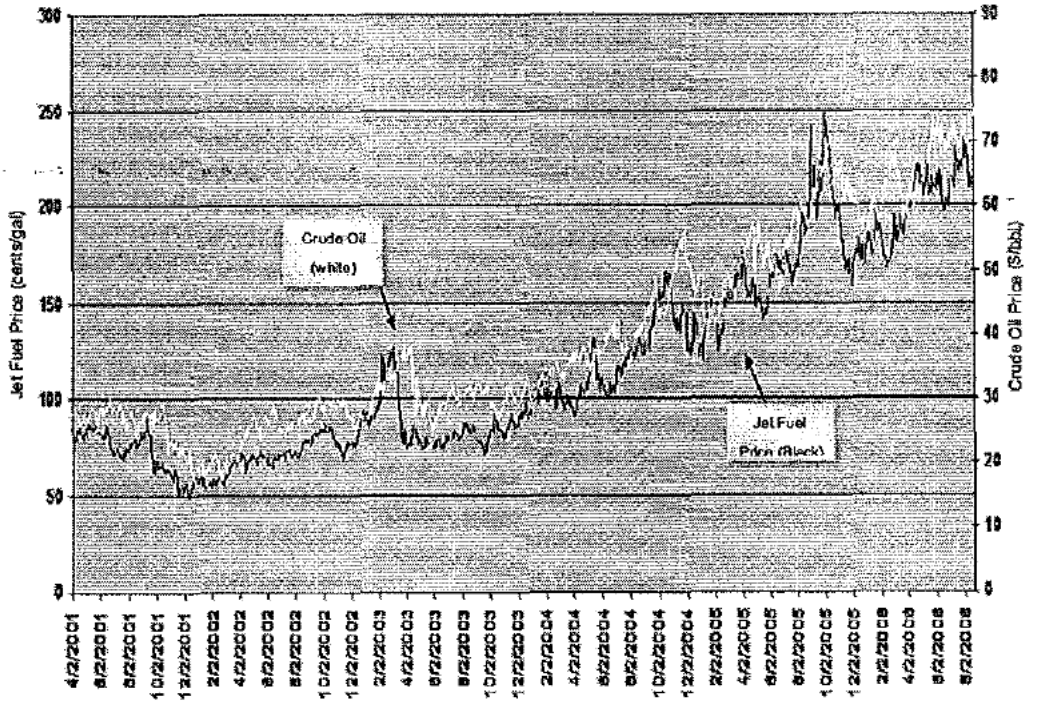
Appendix 1. The volatility of Jet fuel price

This figure shows the average cost per gallon paid per month by US airlines based on data compiled by the Air Transport Association from January 1998 -June 2010.

Jet Fuel Prices (monthly data, not seasonally adjusted) January 1998–June 2010



This figure shows the regional variability of jet fuel prices and crude oil price.



Appendix 2 Disclosure of Airlines' fuel hedging data

American Airlines

Fuel

The Company's operations and financial results are significantly affected by the availability and price of jet fuel. The Company's fuel costs and consumption for the years 2009 through 2011 were:

Year	Gallons Consumed (in millions)	Total Cost (in millions)	Average Cost Per Gallon (in dollars)	Percent of AMR's Operating Expenses
2009	2,762	5,553	2.010	26.5
2010	2,764	6,400	2.316	29.3
2011	2,756	8,304	3.013	33.2

During 2011, 2010 and 2009, the Company's fuel hedging program increased (decreased) the Company's fuel expense by approximately $(335) million, $142 million and $651 million, respectively. As of January 2012, the Company had cash flow hedges covering approximately 21 percent of its estimated 2012 fuel requirements. The consumption hedged for 2012 is capped at an average price of approximately $3.08 per gallon of jet fuel, with protection capped on 2 percent of estimated consumption, through the use of sold call options, at an average of $3.49 per gallon of jet fuel. The Company's collars represent approximately 16 percent of its estimated 2012 fuel requirements and have an average floor price of approximately $2.24 per gallon of jet fuel (both the capped and floor price exclude taxes and transportation costs). A deterioration of the Company's financial position could negatively affect the Company's ability to hedge fuel in the future. See the Risk Factors under Item 1A for additional information regarding fuel.

Year	Gallons Consumed (in millions)	Total Cost (in millions)	Average Cost Per Gallon (in dollars)	Percent of AMR's Operating Expenses
2007	3,130	$ 6,670	$ 2.131	30.4%
2008	2,971	9,014	3.034	35.1
2009	2,762	5,553	2.010	26.5

The impact of fuel price changes on the Company and its competitors depends on various factors, including hedging strategies. The Company has a fuel hedging program in which it enters into jet fuel and heating oil hedging contracts to dampen the impact of the volatility of jet fuel prices. During 2009, 2008 and 2007, the Company's fuel hedging program increased (decreased) the Company's fuel expense by approximately $651 million, ($380) million and ($239) million, respectively. As of January 2010, the Company had cash flow hedges, with option contracts, primarily heating oil collars and call options, covering approximately 24 percent of its estimated 2010 fuel requirements. The consumption hedged for 2010 by cash flow hedges is capped at an average price of approximately $2.48 per gallon of jet fuel, and the Company's collars have an average floor price of approximately $1.80 per gallon of jet fuel (both the capped and floor price exclude taxes and transportation costs). A deterioration of the Company's financial position could negatively affect the Company's ability to hedge fuel in the future. See the Risk Factors under Item 1A for additional information regarding fuel.

*Source from SEC filing

US Airways

Fuel

The average mainline and Express price per gallon of fuel was $3.11 in 2011 as compared to an average cost per gallon of $2.25 in 2010, an increase of 38.2%. Accordingly, our mainline and Express fuel expense was $4.46 billion in 2011, which was $1.28 billion, or 40.5%, higher than 2010 on a 1.0% increase in total system capacity.

Since the third quarter of 2008, we have not entered into any new transactions to hedge our fuel consumption, and we have not had any fuel hedging contracts outstanding since the third quarter of 2009.

Aviation Fuel

The average cost of a gallon of aviation fuel for our mainline and Express operations decreased 44.8% from 2008 to 2009, and our total mainline and Express fuel expense decreased $2.28 billion, or 48%, from 2008 to 2009. We estimate that a one cent per gallon increase in aviation fuel prices would result in a $14 million increase in annual fuel expense based on our 2010 forecasted mainline and Express fuel consumption.

Since the third quarter of 2008, we have not entered into any new fuel hedging transactions and, as of December 31, 2009, we had no remaining outstanding fuel hedging contracts. During 2009, 2008 and 2007, we recognized a net loss of $7 million, a net loss of $356 million and a net gain of $245 million, respectively, related to our fuel hedging program.

*Source from SEC filing

Southwest Airlines

RESULTS OF OPERATIONS

2011 compared with 2010

The Company's consolidated net income of $178 million ($.23 per share, diluted) in 2011 decreased by $281 million, or 61.2 percent, compared to its 2010 net income of $459 million ($.61 per share, diluted). The results in each year were significantly impacted by the Company's fuel hedge program and the accounting requirements related to the derivative instruments used in the Company's hedging activities. As a result of the fuel hedges the Company had in place during 2011—including those that settled during 2011 and those that will settle in future years—the Company recognized a net total of $259 million in losses allocated between Fuel and oil expense and Other (gains) losses, net, in the Consolidated Statement of Income. During 2010, the Company recognized a net total of $426 million in losses as a result of its fuel hedging activities, allocated between Fuel and oil expense and Other (gains) losses, net. Each of these totals for 2011 and 2010 includes the net premium costs the Company paid to enter into a portion of its fuel derivative instruments such as option contracts which are classified as a component of Other (gains) losses, net. See Note 10 to the Consolidated Financial Statements for further information on fuel derivative instruments. The Company's results for 2011 also included a charge for asset impairment of $17 million (before the impact of profitsharing or taxes) related to the Company's decision not to equip its Classic (737-300/500) aircraft with RNP capabilities and AirTran acquisition and integration-related expenses of $134 million (before the impact of profitsharing or taxes). The Company's 2011 operating income of $693 million was lower than the Company's 2010 operating income of $988 million, as the 34.6 percent increase in operating expenses outpaced the 29.4 percent increase in operating revenues.

RESULTS OF OPERATIONS

2009 compared with 2008

The Company's net income of $99 million ($.13 per share, diluted) in 2009 represented a decrease of $79 million, or 44.4 percent, compared to its 2008 net income of $178 million ($.24 per share, diluted). The results in each year were significantly impacted by the Company's fuel hedge program and the accounting requirements related to the derivative instruments used in the Company's hedging activities. As a result of the fuel hedges the Company had in place during 2009 — including those that settled during 2009 and those that will settle in future years — the Company recognized a net total of $408 million in losses allocated between Fuel and oil expense and Other (gains) losses, net, in the Consolidated Statement of Income. During 2008, the Company had recognized a total of $1.0 billion in net gains as a result of its fuel hedging activities, allocated between Fuel and oil expense and Other (gains) losses, net. Each of these totals for 2009 and 2008 includes the net premium costs the Company paid to enter into a portion of its fuel derivative instruments such as option contracts which is classified as a component of Other (gains) losses, net. See Note 10 to the Consolidated Financial Statements for further information on fuel derivative instruments.

2008 compared with 2007

The Company's net income of $178 million ($.24 per share, diluted) in 2008 represented a decrease of $467 million, or 72.4 percent, compared to its 2007 net income of $645 million ($.84 per share, diluted). The majority of the decline in net income was due to the fluctuation of certain gains and losses recorded in association with fluctuations in value of the Company's fuel hedge portfolio. These included adjustments impacting earnings through the recording of gains and/or losses in 2008 and 2007 associated with fuel derivatives expiring in future periods, and settlement/expiration of fuel derivative instruments for cash in 2008 or 2007, but for which gains and/or losses had been recorded in earnings in a prior period. See Note 10 to the Consolidated Financial Statements for further information. Both of these types of adjustments are related to the ineffectiveness of hedges and the loss of hedge accounting for certain fuel derivatives. Adjustments associated with fuel derivative instruments included $19 million in net losses for 2008, and $360 million in net gains for 2007. These are

*Source from SEC filing

Delta Airlines

Fuel

Our results of operations are significantly impacted by changes in the price and availability of aircraft fuel. The following table shows our aircraft fuel consumption and costs.

Year	Gallons Consumed [1] (Millions)	Cost [1][2] (Millions)	Average Price Per Gallon [1][2]	Percentage of Total Operating Expense [1]
2011	3,856	$ 11,783	$ 3.06	36%
2010	3,823	$ 8,901	$ 2.33	30%
2009	3,853	$ 8,291	$ 2.15	29%

[1] Includes the operations of our contract carriers under capacity purchase agreements.

[2] Includes fuel hedge gains (losses) under our fuel hedging program of $420 million , $(89) million and $(1.4) billion for 2011, 2010 and 2009, respectively.

Fuel

Our results of operations are significantly impacted by changes in the price and availability of aircraft fuel. The following table shows our aircraft fuel consumption and costs for 2007 through 2009.

Year	Gallons Consumed (3) (Millions)	Cost (3)(4) (Millions)	Average Price Per Gallon (3)(4)	Percentage of Total Operating Expense (3)
2009 (1)	3,853	$8,291	$2.15	29%
2008 (2)	2,740	$8,686	$3.16	38% (5)
2007	2,534	$5,676	$2.24	31%

(1) Includes Northwest operations for the entire period.

(2) Includes Northwest operations for the period from October 30 to December 31, 2008.

(3) Includes the operations of our contract carriers under capacity purchase agreements.

(4) Net of fuel hedge (losses) gains under our fuel hedging program of $(1.4) billion, $(65) million and $51 million for 2009, 2008 and 2007, respectively.

(5) Total operating expense for 2008 reflects a $7.3 billion non-cash charge from an impairment of goodwill and other intangible assets and $1.1 billion in primarily non-cash merger-related charges. Including these charges, fuel costs accounted for 28% of total operating expense.

*Source from SEC filing

Appendix 3 Disclosure of Airlines' operating expense data

American Airlines

(in millions) Operating Expenses	Year Ended December 31, 2011	Change from 2010	Percentage Change	
Aircraft fuel	$ 8,304	$ 1,904	29.7%	(a)
Wages, salaries and benefits	7,053	206	3.0	
Other rentals and landing fees	1,432	13	0.9	
Maintenance, materials and repairs	1,284	(45)	(3.4)	
Depreciation and amortization	1,086	(7)	(0.6)	
Commissions, booking fees and credit card expense	1,062	85	8.6	(b)
Aircraft rentals	662	82	14.2	(c)
Food service	518	28	5.8	(d)
Special charges	725	725	-	(e)
Other operating expenses	2,907	180	6.5	(f)
Total operating expenses	$ 25,033	$ 3,171	14.5%	

(in millions) Operating Expenses	Year ended December 31, 2010	Change from 2009	Percentage Change	
Wages, salaries and benefits	$ 6,847	$ 40	0.6%	
Aircraft fuel	6,400	847	15.3	(a)
Other rentals and landing fees	1,418	65	4.8	
Depreciation and amortization	1,093	(11)	(1.0)	
Maintenance, materials and repairs	1,329	49	3.8	
Commissions, booking fees and credit card expense	976	123	14.5	(b)
Aircraft rentals	580	75	14.9	(c)
Food service	490	3	0.6	
Special charges	*	(171)	*	(d)
Other operating expenses	2,729	(79)	(2.8)	
Total operating expenses	$ 21,862	$ 941	4.5%	

(in millions)

Operating Expenses	Year ended December 31, 2009	Change from 2008	Percentage Change	
Wages, salaries and benefits	$ 6,807	$ 152	2.3%	
Aircraft fuel	5,553	(3,461)	(38.4)	(a)
Other rentals and landing fees	1,353	55	4.2	
Depreciation and amortization	1,104	(103)	(8.5)	
Maintenance, materials and repairs	1,280	43	3.5	
Commissions, booking fees and credit card expense	853	(144)	(14.4)	(b)
Aircraft rentals	505	13	2.6	
Food service	487	(31)	(6.0)	
Special charges	171	(1,042)	(85.9)	(c)
Other operating expenses	2,808	(216)	(7.1)	(d)
Total operating expenses	$ 20,921	$ (4,734)	(18.5)%	

(In millions)

Operating Expenses	Year ended December 31, 2008	Change from 2007	Percentage Change	
Wages, salaries and benefits	$ 6,655	$ (115)	(1.7)%	
Aircraft fuel	9,014	2,344	35.1	(a)
Other rentals and landing fees	1,298	20	1.6	
Depreciation and amortization	1,207	5	0.4	
Maintenance, materials and repairs	1,237	180	17.0	(b)
Commissions, booking fees and credit card expense	997	(31)	(3.0)	
Aircraft rentals	492	(99)	(16.8)	(c)
Food service	518	(16)	(3.0)	
Special charges	1,213	1,150	*	(d)
Other operating expenses	3,024	247	8.9	(e)
Total operating expenses	$ 25,655	$ 3,685	16.8%	

*Source from SEC filing

US Airways

Operating Expenses:

	2011	2010	Percent Increase (Decrease)
	(In millions)		
Operating expenses:			
Aircraft fuel and related taxes	$ 3,400	$ 2,403	41.4
Salaries and related costs	2,272	2,244	1.3
Aircraft rent	646	670	(3.6)
Aircraft maintenance	679	661	2.6
Other rent and landing fees	555	549	1.1
Selling expenses	454	421	7.7
Special items, net	24	5	nm
Depreciation and amortization	237	248	(4.5)
Other	1,235	1,197	3.2
Total mainline operating expenses	9,502	8,398	13.1
Express expenses:			
Fuel	1,056	769	37.4
Other	2,071	1,960	5.6
Total Express expenses	3,127	2,729	14.6
Total operating expenses	$ 12,629	$ 11,127	13.5

Total operating expenses were $12.63 billion in 2011, an increase of $1.50 billion, or 13.5%, compared to 2010. The 2011 increase in operating expenses was driven by a $1.28 billion, or 40.5%, increase in mainline and Express fuel costs on a 1.0% increase in total system capacity. The average price per gallon of fuel increased 38.2% to $3.11 in 2011 from $2.25 in 2010.

Operating Expenses:

	2010	2009	Percent Increase (Decrease)
	(In millions)		
Operating expenses:			
Aircraft fuel and related taxes	$ 2,403	$ 1,863	29.0
Loss (gain) on fuel hedging instruments, net:			
Realized	—	382	nm
Unrealized	—	(375)	nm
Salaries and related costs	2,244	2,165	3.6
Aircraft rent	670	695	(3.7)
Aircraft maintenance	661	700	(5.5)
Other rent and landing fees	549	560	(1.9)
Selling expenses	421	382	10.3
Special items, net	5	55	(91.6)
Depreciation and amortization	248	242	2.7
Other	1,197	1,152	3.9
Total mainline operating expenses	8,398	7,821	7.4
Express expenses:			
Fuel	769	609	26.2
Other	1,960	1,910	2.7
Total Express expenses	2,729	2,519	8.4
Total operating expenses	$11,127	$10,340	7.6

Total operating expenses were $11.13 billion in 2010, an increase of $787 million, or 7.6%, compared to 2009. Mainline operating expenses were $8.4 billion in 2010, an increase of $577 million, or 7.4%, from 2009, while mainline capacity increased 1.2%.

Operating Expenses:

	2009	2008	Percent Change
	(In millions)		
Operating expenses:			
Aircraft fuel and related taxes	$ 1,863	$ 3,618	(48.5)
Loss (gain) on fuel hedging instruments, net:			
Realized	382	(140)	nm
Unrealized	(375)	496	nm
Salaries and related costs	2,165	2,231	(3.0)
Aircraft rent	695	724	(4.0)
Aircraft maintenance	700	783	(10.6)
Other rent and landing fees	560	562	(0.5)
Selling expenses	382	439	(13.0)
Special items, net	55	76	(27.3)
Depreciation and amortization	242	215	12.5
Goodwill impairment	—	622	nm
Other	1,152	1,243	(7.4)
Total mainline operating expenses	7,821	10,869	(28.0)
Express expenses:			
Fuel	609	1,137	(46.4)
Other	1,910	1,912	(0.1)
Total Express expenses	2,519	3,049	(17.4)
Total operating expenses	$ 10,340	$ 13,918	(25.7)

Total operating expenses were $10.34 billion in 2009, a decrease of $3.58 billion or 25.7% compared to 2008. Mainline operating expenses were $7.82 billion in 2009, a decrease of $3.05 billion or 28% from 2008, while ASMs decreased 4.6%.

Operating Expenses:

	2008	2007	Percent Change
	(In millions)		
Operating expenses:			
Aircraft fuel and related taxes	$ 3,618	$ 2,630	37.6
Loss (gain) on fuel hedging instruments, net:			
Realized	(140)	(58)	nm
Unrealized	496	(187)	nm
Salaries and related costs	2,231	2,302	(3.1)
Aircraft rent	724	727	(0.4)
Aircraft maintenance	783	635	23.2
Other rent and landing fees	562	536	4.9
Selling expenses	439	453	(3.2)
Special items, net	76	99	(23.2)
Depreciation and amortization	215	189	13.7
Goodwill impairment	622	—	nm
Other	1,243	1,247	(0.2)
Total mainline operating expenses	10,869	8,573	26.8
Express expenses:			
Fuel	1,137	765	48.6
Other	1,912	1,829	4.5
Total Express operating expense	3,049	2,594	17.5
Total operating expenses	$ 13,918	$ 11,167	24.6

Total operating expenses were $13.92 billion in 2008, an increase of $2.75 billion or 24.6% compared to 2007. Mainline operating expenses were $10.87 billion in 2008, an increase of $2.3 billion or 26.8% from 2007, while ASMs decreased 2.2%.

*Source from SEC filing

Southwest Airlines

Operating expenses

Consolidated operating expenses for 2011 increased by $3.8 billion, or 34.6 percent, compared to 2010, while capacity increased 22.5 percent compared to 2010. The increase in consolidated operating expenses was primarily due to the inclusion of AirTran's 2011 operating expenses following the acquisition. Historically, except for changes in the price of fuel, changes in operating expenses for airlines are largely driven by changes in capacity, or ASMs. Excluding the results of AirTran following the acquisition, operating expenses increased 17.0 percent. The following tables present the Company's operating expenses per ASM for 2011 and 2010, and year-over-year dollar changes for the same periods showing a reconciliation of the impact of the AirTran acquisition on the comparative results, followed by explanations of these changes on a per-ASM basis and/or on a dollar basis:

(in cents, except for percentages)	Year ended December 31, 2011	2010	Per-ASM change	Percent change
Salaries, wages, and benefits	3.62¢	3.76¢	(.14)¢	(3.7)%
Fuel and oil	4.68	3.68	1.00	27.2
Maintenance materials and repairs	.79	.76	.03	3.9
Aircraft rentals	.26	.18	.08	44.4
Landing fees and other rentals	.80	.82	(.02)	(2.4)
Depreciation and amortization	.59	.64	(.05)	(7.8)
Acquisition and integration	.11	—	.11	n.a.
Other operating expenses	1.56	1.45	.11	7.6
Total	12.41¢	11.29¢	1.12¢	9.9%

Operating expenses

Consolidated operating expenses for 2009 decreased $486 million, or 4.6 percent, compared to a 5.1 percent decrease in capacity. Historically, except for changes in the price of fuel, changes in operating expenses for airlines are largely driven by changes in capacity, or ASMs. The following presents the Company's operating expenses per ASM for 2009 and 2008 followed by explanations of these changes on a per-ASM basis and/or on a dollar basis (in cents, except for percentages):

	2009	2008	Increase (decrease)	Percent change
Salaries, wages, and benefits	3.54¢	3.23¢	.31¢	9.6%
Fuel and oil	3.11	3.60	(.49)	(13.6)
Maintenance materials and repairs	.73	.70	.03	4.3
Aircraft rentals	.19	.15	.04	26.7
Landing fees and other rentals	.73	.64	.09	14.1
Depreciation and amortization	.63	.58	.05	8.6
Other	1.36	1.34	.02	1.5
Total	10.29¢	10.24¢	.05¢	.5%

Operating expenses

Consolidated operating expenses for 2008 increased $1.5 billion, or 16.6 percent, compared to a 3.6 percent increase in capacity. Historically, except for changes in the price of fuel, changes in operating expenses for airlines are largely driven by changes in capacity, or ASMs. The following presents the Company's operating expenses per ASM for 2008 and 2007 followed by explanations of these changes on a per-ASM basis and/or on a dollar basis (in cents, except for percentages):

	2008	2007	Increase (decrease)	Percent change
Salaries, wages, and benefits	3.23¢	3.22¢	.01¢	.3%
Fuel and oil	3.60	2.70	.90	33.3
Maintenance materials and repairs	.70	.62	.08	12.9
Aircraft rentals	.15	.16	(.01)	(6.3)
Landing fees and other rentals	.64	.56	.08	14.3
Depreciation and amortization	.58	.56	.02	3.6
Other	1.34	1.28	.06	4.7
Total	10.24¢	9.10¢	1.14¢	12.5%

*Source from SEC filing

Delta Airlines

Operating Expense

(In millions)	Year Ended December 31, 2011	2010	Increase (Decrease)	% Increase (Decrease)
Aircraft fuel and related taxes	$ 9,730	$ 7,594	$ 2,136	28 %
Salaries and related costs	6,894	6,751	143	2 %
Contract carrier arrangements	5,470	4,305	1,165	27 %
Aircraft maintenance materials and outside repairs	1,765	1,569	196	12 %
Passenger commissions and other selling expenses	1,682	1,509	173	11 %
Contracted services	1,642	1,549	93	6 %
Depreciation and amortization	1,523	1,511	12	1 %
Landing fees and other rents	1,281	1,281	—	— %
Passenger service	721	673	48	7 %
Aircraft rent	298	387	(89)	(23)%
Profit sharing	264	313	(49)	(16)%
Restructuring and other items	242	450	(208)	(46)%
Other	1,628	1,646	(18)	(1)%
Total operating expense	$ 33,140	$ 29,538	$ 3,602	12 %

Operating Expense

(In millions)	Year Ended December 31, 2010	2009	Increase (Decrease)	% Increase (Decrease)
Aircraft fuel and related taxes	$ 7,594	$ 7,384	$ 210	3 %
Salaries and related costs	6,751	6,838	(87)	(1)%
Contract carrier arrangements	4,305	3,823	482	13 %
Aircraft maintenance materials and outside repairs	1,569	1,434	135	9 %
Passenger commissions and other selling expenses	1,509	1,405	104	7 %
Contracted services	1,549	1,595	(46)	(3)%
Depreciation and amortization	1,511	1,536	(25)	(2)%
Landing fees and other rents	1,281	1,289	(8)	(1)%
Passenger service	673	638	35	5 %
Aircraft rent	387	480	(93)	(19)%
Profit sharing	313	—	313	NM (1)
Restructuring and other items	450	407	43	11 %
Other	1,646	1,558	88	6 %
Total operating expense	$ 29,538	$ 28,387	1,151	4 %

Operating Expense

(in millions)	GAAP Year Ended December 31, 2008	Predecessor + Successor Year Ended December 31, 2007	Increase (Decrease)
Operating Expense:			
Aircraft fuel and related taxes	$7,346	$4,686	$2,660
Salaries and related costs	4,329	3,759	570
Contract carrier arrangements	3,766	3,275	491
Depreciation and amortization	1,266	1,164	102
Aircraft maintenance materials and outside repairs	1,169	983	186
Contracted services	1,062	910	152
Passenger commissions and other selling expenses	1,030	933	97
Landing fees and other rents	787	725	62
Passenger service	440	338	102
Aircraft rent	307	246	61
Profit sharing	—	158	(158)
Impairment of goodwill and other intangible assets	7,296	—	7,296
Restructuring and merger-related items (1)	1,131	—	1,131
Other	1,082	881	201
Total operating expense	$31,011	$18,058	$12,953