



**FUEL HEDGING IN THE AIRLINE INDUSTRY
A CASE STUDY ON MALAYSIA AIRLINE**

BY

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APPROVAL PAGE

I certify that I have supervised and read this Project Paper and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a Project Paper for the degree of Master of Business Administration.



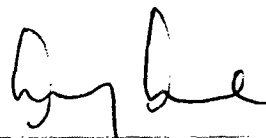
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I hereby declare that this research is the result of my own investigations, except where otherwise stated. Other sources are acknowledged by explicit references and a bibliography is appended.

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DEDICATION

I dedicate this work of mine, to my beloved parents and my beloved wife Zeenath, who has always been there for me and supported me with her love, to make it through all those extremely difficult circumstances I have been faced with. I dedicate it to my precious children, Fawzan, Yanis and Ian. It would have been impossible to complete this project without their love.

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ABSTRACT

The cost of jet fuel is the second largest operating expenditure in the airlines sector. Even a small increase in the fuel price often leads to a significant increase of expenditure on the operating cost of the airlines. Airlines use derivatives as hedging instruments for hedging their fuel requirements. However, derivative contracts on jet fuel, is not often traded in exchanges and the airlines engages themselves in cross hedging. This practice exposes them to another risk known as basis risk, while protecting them from the price risk. The primary objective of this paper is to look into the effectiveness of cross-hedging practiced by the airline industry. It looks into the problem of basis risk attempting to identify its' significance in terms of un hedged exposure it creates which could possibly lead to very significant financial losses. The effectiveness of hedging strategy of Malaysia Airlines was analyzed using secondary data obtained on the proxy commodity used by the airline. The data was analyzed using standard practices of airline industry in designing an optimal hedge. The calculations made attempts to identify the proportion of the price risk volatility that can be hedged and the proportion of the exposure that remains un hedged, when the said proxy is used to hedge jet fuel. The result showed that a significant portion of the price risk volatility remained un-hedged. This finding was in agreement with the established theory that high correlation between commodities does not remove the basis risk. It concludes that along with many other factors, the un-hedged exposure due to basis risk would have contributed to the losses suffered by the airline in their fuel hedge for the year 2011, unless precise measures are taken to hedge the basis risk.

CHAPTER ONE

INTRODUCTION

Managing a large business investment in the presence of the uncertainty in the business world today is a challenging task. The businesses are potentially exposed to various risks resulting from the adverse movement in interest rate, exchange rate and commodity prices. These issues remain the focal point of all organizations engaged in businesses as it is directly related to the organizations' performance in terms of operating income and profit.

For those organizations that take oil as their primary input, the price volatility of oil is of major concern. The continuous increase in global energy consumption along with many other factors is an indication that the days for cheap oil might not return. It is reported that the US Energy Information Administration (EIA) predicts global energy demand to climb up to 88.2 million barrel per day (mbpd), and that it would follow an annual growth of 1.4mbpd between 2009 and 2015. Gosh (2011)

Thus, for a corporation or an organization that takes oil as their primary input for their business operations, it is extremely important and necessary to have significant resources available in hand and dedicated to design and implement risk management strategies to protect themselves against unfavorable price movements that could have an adverse impact on the company's performance.

The airline industry is an industry in which all the operating companies are exposed to this risk, which can result in significant losses in terms of income, if necessary preventive measures are not taken into account in advance. It is an industry that is capable of capturing interest of a huge number of business demand and travelers worldwide with its ability to provide the most comfortable and faster means of travel with excellent services offered to its customers throughout their journey. It is an industry with enormous unpredicted business opportunities and unlimited development potential. Over the years, the industry has witnessed that travel remains a large and constantly growing business that accelerates economic growth, world trade, foreign direct investment and tourism. Thus, it serves as a means of globalization for many other industries.

Along with the fascinating service of traveling it offers, the airline industry is also exposed to various risks in terms of business, security and safety. The high operating cost is a key entity that could turn the operations into unrecoverable losses that could ultimately lead to bankruptcy, if not handled with strategic planning and monitoring. Hence the industry employs various strategies of managing the risk it is exposed to. The increasing price of jet fuel has put constant pressure on the airline industry. It is the second largest operating expenditure for the airlines. The International Air Transport Association (IATA) reported in its' press release no 15 of 2011, that the cost of fuel used to represent about 17% of the total operating cost for major airlines in the past, whereas at present, it represents over 29% of the total operating cost.

Needless to say, with this significance, any unfavorable fluctuation in the fuel price would inevitably have a significant adverse impact on the airline, if the airline had not taken preventive measures such as hedging¹ their fuel requirements. Hence fuel hedging has become a common practice in the airline industry today. The effectiveness of fuel hedging in terms operating gains and losses has been a subject under research and discussion for decades. While some advocates on the importance of fuel hedging, others have strongly argued that fuel hedging do not serve the purpose of protecting the airline against the possible losses due to price uncertainty of jet fuel.

While there can be several incentives behind fuel hedging, it becomes evident that the risk associated with the volatility of oil prices, is a key factor that forces airlines to take the preventive measures by hedging their future fuel requirements. The strategies adopted by different airlines vary depending on the requirements and the financial strength of the airline and various other factors such as the volatility and maturity dates of the traded contract. It is known that financially more profitable and stable airlines adopt more aggressive hedging while the less profitable and financially weak airlines do otherwise. The airlines have various hedging strategies available to them including the use of different derivative instruments and remaining un-hedged.

¹Hedging is a position taken in an investment, using different types of financial instruments, aimed at protection or offsetting of potential losses that may occur.

1.1 BACKGROUND OF THE STUDY

Airlines use derivatives as hedging instruments for hedging their fuel requirements. However, derivative contracts on jet fuel, is often not traded in exchanges and hence airlines are required to look for other commodities that they can use as means to hedge the jet fuel. This practice of using other commodities to hedge the jet fuel, is known as cross hedging. When engaging themselves in cross hedging, the airlines are actually exposing themselves to another risk, while protecting themselves from the risk of price fluctuation. This is known as the basis risk². It is an important risk that should be taken into account when entering into fuel hedging. It is created when the value of the commodity being hedged do not change in same proportion with the value of the commodity of derivative contract used.

In the derivative market, it is more specifically described as the differential between the cash price of the commodity that is required to be hedged and the price of the derivative contract that is used to hedge the commodity.(Carter,Rogers,&Simkins, nd).If the underlying commodity and position match perfectly, then the basis risk is ideally removed and the hedge is known as an ideal hedge. This is however not quite possible in the real world and hedging instruments that perfectly mirror a given price risk are not always available.

²The basis risk is the risk associated with imperfect hedging by using derivatives. The difference between the asset being hedged and the asset underlying the derivative results in this risk. A mismatch between the expiration date of the derivative contract and the actual selling date of the asset also leads to this risk.

With this risk being present along with many other risk factors in the entire process of designing the strategy for hedging the jet fuel, air lines employ skilled specialists for the task and various factors are taken into account to design a corporate hedging strategy for the company.

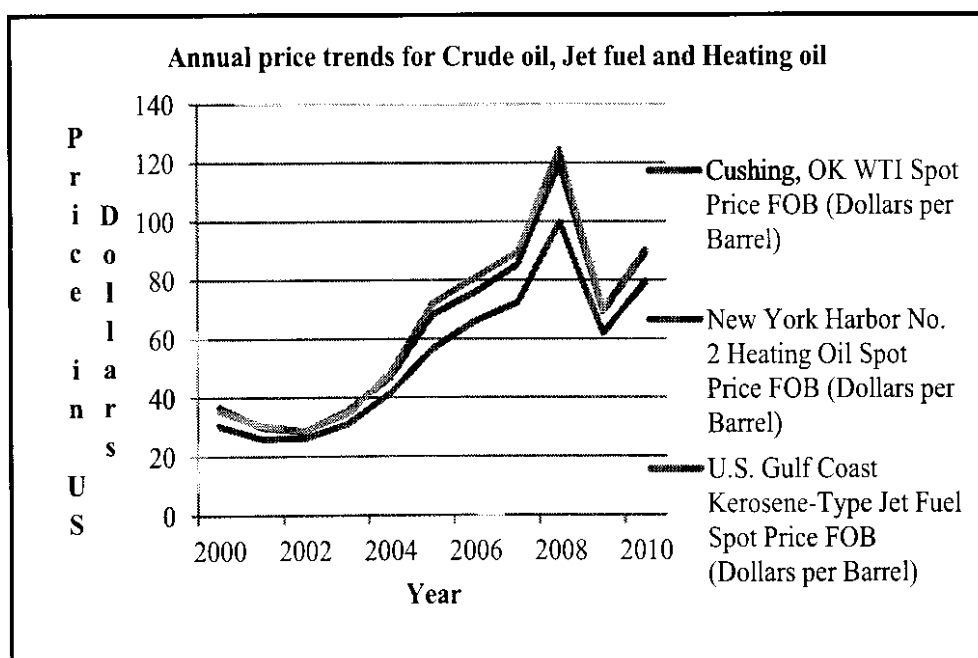
A practice widely used in the industry is to look for commodities that can be used to hedge the price risk of the other commodity, by analysis of historic data and establishing the correlation that is taken into account as the primary factor to determine the commodity to be used. A very high correlation between two commodities is often considered or assumed to offer the required protection against the price risk of the commodity being hedged. The optimal hedge is then worked out using the correlation factor and the hedge ratio which represent the ratio of the size of the position taken in futures contracts to the size of the exposure. But a true picture of the protection achieved by a cross hedge can only be seen, when the basis risk is taken into account. The optimal hedge is aimed to offer the protection against the rise in fuel prices. Yet, it is often seen that the said purpose is not served. Depending on the nature and type of contract, the benefits of the hedge can vary significantly. Interestingly the amount of protection that can be offered by the hedge designed in this manner, could not be guaranteed as its' effectiveness is subjected to vary with many other factors. Yet, the presence of the basis risk and the losses it could lead to, has not stopped airlines engaging in cross hedging. The risk associated with the price volatility of jet fuel, is so high that it has obligated airlines to insure against it, regardless of the risk present in the process of hedging itself.

With the strategy used for hedging vary by a great degree for every airline, and while the result has proven to be very fruitful to some airlines, others barely manage to stay in business and some faces losses in spite of the expertise in hand to design their strategy. This being the reality, the question whether fuel hedging is an effective means to protect an airline from possible losses due to fuel price volatility, remains a subject under discussion by various analysts with different view of opinion.

1.2 TEN YEARS PRICE TRENDS FOR CRUDE OIL, JET FUEL AND HEATING OIL (2000-2010)

In this section, oil price trends for the past ten years are studied. The main focus here is to see the relationship between the price movements of the commodity that move in tandem with the jet fuel. The analysis would focus on the economic factors contributing to the instability.

Fig1: Annual price trends for Crude oil, Jet Fuel and Heating Oil



Source: EIA (2011)

As can be seen from the graph, the three commodities, crude oil, heating and jet fuel has a direct relationship in price movement. A steady increase in the price is observed throughout the period when the highest price of the three commodity occurred during 2008. The cost of crude oil is said to be the greatest single factor influencing petroleum prices. It plays an important role in determining the price of petroleum products because it is the primary raw material used to produce them. As a single factor, it is known to represent about 50% of the retail price. However, other factors such as supply and demand competition, foreign exchange, geographic location and government regulation too are known to have significant effect on the petroleum prices.

Both crude and heating oil are commodities used by airlines to hedge jet fuel. From the above data, it is seen that the price of heating oil and jet fuel has risen in tandem with crude oil. The driving factors behind this uptrend are, the increased consumption of petroleum as a result of strong economic growth leading to strong global demand, capacity limitation in oil production, and political instability. The facts that most of the world's oil is located in the most politically unstable parts of the world, has always remained a threat to create a balance between supply and demand. It also serves as a key factor for the speculations leading to uptrends in the prices.

Looking at the trend presented above and considering that the price increases are contributed by the factors mentioned above, of which the global consumption plays a major role, whether the world's oil reserve would continue to meet the

demand or not remains a question under investigation by researchers and analysts. It is said that more and more oil producing countries are already approaching their maximum capacity and hence, the production of oil would decline while the demand would continue to rise (Tobias 2011). This would inevitably widen the gap between the demand and supply forcing the price to increase, perhaps to a level that most nations cannot afford.

Analysts believe that the global oil demand would hit a new record in 2011, with much of the expected higher demand coming from the emerging markets (Gosh, 2011). They believe that OPEC which supplies about 40% of the worlds' oil supply has not changed its' quotas since 2008 and that their reluctance to increase output and the prospect of US dollar weakness would add to oil being costlier in 2011 (Brown, 2011)

A scenario as such, would not only hit the aviation industry making travelling expensive or perhaps unaffordable. It would also impact other industries such as the agricultural industry, leading to rise in food prices making it impossible for consumers to pay for industrial products. As the crude oil is linked with many industrial products that people consume, its' scarcity leading to higher prices would inevitably have a huge impact on every industry and hence every individual alike.

Heating oil and jet fuel being products of crude oil, they have always shown a price movement in tandem to the crude oil price. In the period under study, their percentage increase in price is almost equal, with crude oil price increasing by

61.78%, heating oil by 58.78% and jet fuel price 60.45%. Thus, derivatives on both heating oil and crude oil are widely used by the airline industry for hedging jet fuel. All factors that has an impact on the price of crude oil, would lead to a similar impact on the price of heating oil and jet fuel.

1.3 CURRENT FUEL PRICE TRENDS

The year 2011 marked history in terms of peaceful demonstrations on the streets of the Arab countries attempting to over throw the decades old dictatorships in all the Arab countries. Witnessing result achieved by the demonstrators of the Egypt, overthrowing the dictatorship which ruled the country for over 30 years, the demonstrations spread like wildfire in all Arab countries. The impact of these demonstrations on the world economy is yet to be seen. The oil prices boomed few days after the demonstrations reached Libya, whose oil accounts for a significant portion of the world oil production as it is the 12th largest oil export in the world. In the early days of these demonstrations, the analysts predicted the oil prices could reach as high as US\$200. As a result, oil prices are getting driven by speculation and IATA raised its 2011 average oil price assumption to \$96 per barrel of Brent crude (up from US\$84 in December), in line with market forecasts.

1.4 THE CAUSES OF JUMP IN OIL PRICE

In general upsurges in oil prices are dependent on factors such as political unrest and speculative market condition. The present uptrend is caused mainly by the political unrest in the Arab world. Apart from political unrest, the pressure and uncertainties surrounding availability of Middle Eastern supplies has also resulted in a

shoot in the oil price in the past years. Threats to oil refineries, such hurricane and terrorist attacks are also known causes to push the oil price higher at times.

Another fundamental problem that leads to rise in the oil prices is the growth of demand beyond the expected and forecasted level. The rapid growth in demand is always a result of countries moving towards industrialization. Many analysts believed that the rise in fuel price in 2008 was lead by growing demand from China and India. As demand increases, oil-producing nations reduce the supply in order to add value to the limited oil available in the marketplace. As a result, during times when consumers are likely to buy more, usually there are sudden increases in the price per gallon. Prices will usually stabilize when consumption decreases, because the supply is no longer considered as valuable.

Speculative market condition in the industry is another factor that has always played a role in fluctuations of the oil prices. Speculators in the oil market usually would invest in oil future contracts when the price of the commodity is low. They would sell them at a higher price in order to gain a profit. The speculators play a significant role in the raising or lowering of oil prices. Because with the speculative activity, they have a certain amount of control in supply and demand. This means that with their speculation, they will try to keep the commodity from entering the marketplace in order to increase demand and therefore increase the price. Since the speculator activities and oil market are not directly regulated and monitored, it is somehow difficult to determine how much of an impact and influence speculators

have on the price of oil. The most important and the most significant cause that leads to rise in the oil prices is political unrest. And the year 2011 began with this threat attacking the industry as a whole

1.5 IMPACT OF FUEL COST INCREASE ON AIRLINE INDUSTRY

The impact of fuel price volatility on airlines depends on whether they have adopted a fuel hedging strategy or not and how effective the strategy they adopt proves to be. In order to protect themselves from the possible losses resulting from the upsurges in oil prices, most airlines enter into fuel hedging. The rise of fuel prices has increased its proportional contribution to airline costs as it now represents about 38 % of the total expenditure for airlines like the Malaysia Airlines.

In line with market forecasts, IATA revised its' early prediction and rose its' 2011 average oil price assumption from US\$86 to US\$96 per barrel of crude. Including the impact of fuel hedging, which is roughly 50% of the expected consumption, IATA reports that this will increase the industry fuel bill by US\$10 billion to a total of US\$166 billion. Compared to levels in 2010, oil prices are now expected to be 20% higher in 2011. The Director General and CEO of IATA, is reported to have said that, for every dollar increase in the average price of a barrel of oil over the year, airlines face the difficult task of recovering an additional \$1.6 billion in costs (IATA Press release no 15, 2011).

In general, the rise in jet fuel price would influence the airline industry in two major aspects. Firstly, it would inevitably increase the airlines' operating cost reducing their profit. Secondly, an increase in oil price, if sustained long enough, could often lead to a recession where by the demand for air travel would diminish significantly. Hence it is very clear that an increasing trend in fuel price if sustained long enough, would have a serious negative impact on the airline industry.

1.6 RESEARCH OBJECTIVES

While airlines may use several forms of insurances for protecting themselves from possible losses due to various risks such interest rate risk, exchange rate risk and commodity price risk, the use of derivatives to counter the price volatility of jet fuel is one of the most common form of security airlines engage into, as part of their business strategy. Thus, fuel hedging has become a common practice in the airline industry. It is widely accepted as a tool for protecting the airline from significant losses the company might have to bear due to price volatility of jet fuel, though the process itself creates and carries significant risks, which can translate into huge financial losses.

One of the major risks that are involved in the process of fuel hedging is the basis risk that gets created when airlines enter into cross hedging. The airlines are inevitable to be exposed to this risk as they engage themselves into cross hedging, as this is a risk that gets created in the process itself due to the mismatch that is present in commodity price, location and time.