WORKING DRAFT
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Fuel Hedging as an Element of Airline Risk Management Policy

Major Airlines, Recent Experience

DRAFT Report for:

"An International Airline"

DRAFT Report by:

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Background

In September 2009, “An International Airline” (“AIA”) approached R.W. Mann & Company, Inc. (“RWM”) to perform a strategic review of “AIA”’s fuel hedging program.

In October 2009, RWM drafted the scope of a strategic review proposal, which, after further negotiation with the team, “AIA” accepted in December 2009.

“AIA” briefed RWM and other team members at on-site meetings in January 2010 and identified for review several issues surrounding “AIA”’s use of fuel hedging:

1. The fundamental question, “to hedge or not to hedge?”
    a. “AIA” experience
    b. Industry benchmarking (impact and effectiveness over timeframes)

2. Assuming fuel hedging were to continue, is the right structure in place to hedge and source product; are the right tools in place, used effectively?
    a. Hedging and logistics organization(s) and skills sets
    b. Decision support systems

3. Assuming the structure and tools are appropriate, are the tenor and extent of hedging appropriate?
    a. Liquidity at duration, regional location
    b. Extent of uplift by major market (AIA’S MAJOR HUB, NYC, LON)
    c. Forward market opportunities (contango)

4. Assuming the tenor and basis are correct, what basis should be hedged?
    a. Raw and refined product basis, considering regional differentials
    b. Crack indexing opportunities: crude-gasoil-JET A1

5. Financial impact and presentation issues: margins, cash flows, hedge effectiveness, IFRS considerations on structures and basis choices

This WORKING DRAFT responds to aspects of several fundamental questions and is intended to dovetail with portions of the project to be accomplished by “the Trading Firm”, along with a review of prior results and ongoing proposals in the IFRS context to be accomplished by others.

This working draft may be updated upon request of “AIA”, subject to receipt of a supplementary agreement.

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Executive Summary

Fuel cost risk mitigation as a part of financial risk management 'best practice' involves significant investment in efficiency, actively hedging fuel price, aggressive strategic sourcing of fuel logistics, and aggressive efforts to place risk with end-consumers by unbundling and assessing customers for volatile cost factors, including fuel.

Forward-thinking airlines invest in aggressive fleet renewal and engage in operational efficiency programs to reduce fuel consumption while also developing renewable alternative fuel sources and adapting to Emissions Trading Schemes.

Strategic sourcing/supply chain/logistics programs round out the means by which airlines have driven down their rate of fuel expense growth and into-wing cost. Joint ventures on fuel logistics and into-plane contracts can reduce final into-wing cost, especially at key uplift stations. An alternative/JV fuel farm at AIA's MAJOR HUB offers significant appeal and benefit over the existing monopoly priced facility.

Competently executed hedging programs help carriers avoid systemic risk of underinvestment in fleet, technology and joint ventures caused by volatile swings in cash flows, and reduce earnings beta, improving carrier investment profile.

As long accepted practice, scheduled passenger airlines have out-placed the risk of fuel price volatility on contractors for charters and cargo, effectively hedging fuel costs on by-product segments of their primary business that typically comprise only a small percentage of scheduled passenger flying and fuel consumption.

Airlines have begun to tactically "unbundle" and levy surcharges and fees directly on retail customers for service cost factors, fuel being by far the most significant such charge. Parsing out total fuel cost from "base fare" signals the significance of this cost factor, signals competitors, and out-places a portion of volatility risk.

The rise of energy costs to the industry's most significant and volatile line of expense and a key determinant of cash flow and profitability swings caused many airlines to add fuel price hedging to Corporate Treasury and Risk Management functions, significantly broadening the scope, extent and value protected and realizable through financial risk management, beyond foreign exchange and interest rate management.

A US CFTC Notice of Proposed Rulemaking (NPRM) imposes trading limits on the ten largest traders in energy products that may impact market liquidity and premiums, in addition to the stated objective of reducing energy price volatility.

Major Takeaways

- ✈ Most airlines hedge fuel costs and attempt to manage fuel price risk by long-term strategic as well as short and medium-term tactical means, as a part of overall financial risk management efforts.

- ✈ An airline's best natural fuel hedge is the most fuel-efficient fleet available, flown only on a network of money-making routes, achieved by frequently pruning out economically obsolescent fleets, and loss-making aircraft cycles and routes.

- ✈ The most effective fuel hedge is to outplace all fuel-volatility risk to the end-consumer at time of booking, as has long been accepted practice with charter and cargo contracts. Though this may at present be competitively untenable for scheduled service tariffs, it bears future consideration and to a limited degree is being accomplished via parse-outs and surcharges.

- ✈ Structural fare increases and fuel surcharges are at present under-valued and capable of recovering significant portions of the impact of fuel cost increases on yet-to be booked capacity, limited by lags on introduction and competitive response.

- ✈ Discounts to full cost recovery result from implementation lags, market demand attenuation, elasticity and switching losses due to surcharges and to total ticket price, and from lack of competitive response.

- ✈ The remaining, incremental exposure to fuel price volatility, on both previously booked and on available but yet-unutilized scheduled capacity, must be managed by physical and financial hedging programs.

- ✈ Airlines use decision support tools (e.g. SolArc et al) to transact and manage hedge portfolios on a variety of fixed rule-based time-frames (monthly, quarterly) as well as dynamically ("on-condition"), as well as via long-term strategic capital programs (fleet planning and renewal).

- ✈ In general, less intellectual resource and budget is applied to hedging than to capital programs, despite the availability of competent decision support software and "dashboards".

- ✈ Fuel price hedging structures and portfolio management efforts have increased with the sophistication of fuel market instruments available, with changes in carrier and market liquidity, and with the need to hedge against the observed divergence of jet fuel prices from crude basis prices (crack spread volatility) which has tended to coincide with greater volatility in crude prices, which further prompts the need for decision support tools.

- ✈ "Strategic sourcing" of fuel logistics and into-plane contracts can further reduce the final into-wing cost of fuel and may involve capital projects

- Two such capital projects are acquisition of decision support software such as SolArc RightAngle and creation of a joint venture MAJOR HUB fuel farm and distribution system

- Strategic sourcing should also utilize a drumbeat of broad-based, rapid-fire purchasing solicitations/negotiations.

- US Dollar revenue receipts balanced against US Dollar-based energy costs can provide non-US based airlines an element of protection from the risk of exchange rate movement impact on fuel expense, but like US Dollar-based fleet/capital programs, requires additional scope and extent of foreign exchange rate hedging to protect against adverse currency movements.

- The converse is also true; predominantly non- US Dollar receipts and secular variation in US Dollar weakness mask the real rise in US Dollar-denominated energy costs then snaps back with resurgence in US Dollar strength, creating dual-pronged adverse leverage on energy costs.

- Future hedging practice and economics may be influenced by a pending US Commodities Futures Trading Commission (CFTC) NPRM.

- To curb speculation, CFTC has proposed setting position limits on energy futures in crude oil and refined products including heating oil, gasoline, natural gas, and jet fuel, similar to the curbs it has in place for agricultural commodities, with exemptions for large energy consuming firms who hedge energy supply costs.

- The CFTC action appears to target the top ten trading firms who make markets in, and promote and sell hedging vehicles for jet fuel.

- It remains unclear to what extent this regulatory proposal will affect energy market volatility or overall energy market liquidity, which could impact on hedging premiums.

Fleet and Operational, Non-hedging Programs

Airlines focus on increasing fuel efficiency through capital programs (fleet, ground support and power) and by improving their operations profiles and engine and aerodynamic performance through programs such as satellite-based ATC, RVSM, continuous decent approaches, engine SFC enhancements, engine/airframe cleaning, and winglets, the effects of all of which compound to reduce total fuel burn and cost.

Airlines continue to adopt and refine IATA's list of best practices, as well as procedural and technical modifications and developments ranging from aircraft and BFE tare weight reduction to single-engine taxi and active C/G management on aircraft so-equipped.

Subject to demonstration of in-service reliability and economics, investment in next generation composite airframes and geared fan/open rotor aero-engines appear to offer significant fuel savings promise over the longer-term. As part of the fleet renewal effort, airlines have aggressively pruned out fuel-adjusted economically obsolescent fleets and network links on which they are unable to earn returns.

Other investment initiatives include developing renewable, non-petroleum based transportation fuels for inflight and ground usage, and adapting to Emissions Trading Schemes (ETS).

Jet Fuel Logistics Enhancements

Instead of passively waiting for broker/dealer/into-wing servicing offers, the use of realtime market data mining and a "fuel hedging/logistics dashboard" permits a few key individuals to actively identify local, physical and out-of-region basis fuels as indices and opportunities for effective physical purchasing and hedging.

Beyond hedging and managing commodity costs, "strategic sourcing" and increasing the frequency and aggressiveness of supplier tenders on fuel logistics and into-plane contracts can further reduce the final into-wing cost of fuel.

Much as was achieved with the joint, into-plane venture with Mercury, a joint venture capital project such as a competing MAJOR HUB fuel farm and distribution network appears to be a compelling opportunity to reduce into-plane costs at the airport representing 55% of "AIA"'s fuel uplift.

A competing entity should be capable of providing "AIA" with an annuity associated with JV fuel flow to other subscribers on the field.

Fuel Hedging Programs

Airline operating margins and earnings are highly sensitive to fuel prices and, for non-US Dollar denominated carriers, to US Dollar exchange rates. Fuel hedging can buy stability in volatile markets, whether in contango or backwardation, but may offer little benefit other than trading and resulting cash flow timing in stable, high fuel price scenarios.

Fuel price risk can be managed by airlines in numerous ways, including exchange traded and bespoke forward and futures contracts, options, collars, swaps and combinations (three-and four-way structures) issued on the basis of crude (WTI, Brent, Russian Export, etc.), intermediate refined products with greater liquidity, acting as a proxy for Jet-A/A1 specification turbine fuel (heating oil, gasoil, etc.), as well over the counter trades in Jet-A/A1 itself. Crack spread index structures attempt to fix what has been an increasingly volatile portion of fuel cost.

Hedge program management practice is a function of high level, agreed risk management policies which range from highly structured, infrequent and passive, nurturing monthly and quarterly positions to maturity, to highly leveraged, high-frequency and active portfolio management, nearing the point of realtime trading of short-term positions, entered and exited opportunistically.

Most fuel prices and contracts with suppliers are generally quoted in US Dollars. The added extent of fuel expense currency risk is also hedged by most airlines, notably those with limited US Dollar revenues to balance US Dollar expenses.

Especially relevant is recent European carrier experience: a multi-year rise in oil prices, the Euro impact of which was largely negated by a coincidently weakening US Dollar, followed by rapid, steep fall in oil prices, the Euro impact of which was largely negated by a coincident strengthening US Dollar.

Typically, due to the amount of exposure generated, jet fuel hedge program management practice is a function of agreed risk management policies formed at the Board, Board Committee and Senior Management level, executed in the Treasury function, with logistics applied in supply chain functions.

Fuel hedging organization size is less than commensurate with the complexity and activity level of the hedging effort, ranging from as few as two dedicated to as many as five or six individuals with cross-functional responsibilities to manage efforts that range from highly structured, infrequent and passive, nurturing monthly and quarterly positions to maturity, to highly leveraged, high-frequency and active portfolio management, nearing the point of realtime trading of short-term positions, entered and exited opportunistically.

Fuel Hedging Decision Support

Southwest uses the SolArc, Inc. “RightAngle” realtime market data suite, “dashboards” and decision support systems to leverage the strategic, trading and intellectual knowledge of a three person fuel hedging staff conducting a dynamic trading program that has generated significant, cumulative long term value.

SolArc, Inc. is a global provider of multi-commodity supply, logistics, trading, and risk management software and services, founded in 1991 by former Andersen/ Accenture partners. SolArc trading and logistics management services are used by more than 50 leading firms including Chevron, ConocoPhillips, JP Morgan and Barclays Capital. SolArc's software and services cover a range of vertical industries, including Energy, Transportation and Finance.

In 1994, SolArc introduced for liquid hydrocarbon trading their RightAngle platform, which integrated trading, scheduling, accounting and risk management. Based on the rapid adoption and success, SolArc began building its Supply and Trade Management vision to serve all energy commodities from a single, unified platform. The current version of SolArc RightAngle is capable of supporting the trading of multiple energy commodity classes including crude oil, refined products, fuels, natural gas liquids, natural gas and coal from a single platform.

Other SolArc transportation users include: Singapore, JAL, SAS, Virgin Atlantic, United, Northwest, Frontier, Skywest, and Union Pacific Railroad.

The DRAFT table following (expanded as Appendix A) gives an indication of the extent and structures of fuel price hedging programs at major US, European and Asian airlines from 2005 to present, with most recently indicated hedge portfolios out to 2011 and in some cases beyond. Where price data and/or terms are not shown, they are not available from public sources. Hedge counterparties, brokers/dealers/arrangers are not shown.

Comments include changes to airline fuel hedging/risk management policies or implementation in the wake of the 2008/2009 price rise and decay. Significant unwinding and reformulation of positions and policies resulted, generally, with tenors shortened and extents reduced.

Fuel Hedging Policies and Implementations

Major Airlines, 2005-onward

Fuel price hedging attempts to manage fuel price risk, by both short and medium-term tactical as well as long-term strategic means.
The complexity of fuel price hedging structures and efforts has increased with the sophistication of market instruments available.
Airlines transact and manage on a variety of fixed time-frames (monthly, quarterly) as well as dynamically ("on-condition").
1./ The best natural fuel hedge is the most fuel-efficient fleet available, flown only on a network of money-making routes achieved by pruning out loss-making aircraft cycles and routes.
2./ The most effective fuel hedge is to outsource fuel-volatility risk to the end-consumer at time of booking as practiced wth charter and cargo contracts, but may be less competitively tenable.
3./ Structural fare increases and fuel surcharges are able to recover up to 50% of the impact of fuel cost increases, the discounts resulting from market demand attentuation and competitive response.
4./ The balance of exposure to fuel price volatility, on booked and available capacity, must be managed by physical and financial hedging programs.

Airlines in restructuring typically have not had the credit or liquidity to mount significant hedging programs and have often liquidated in-the-money positions to raise cash.

"Low Cost" airlines relying to a significant degree on ancillary revenue generation for top line revenue performance have some of the highest limit-extents on hedging perhaps due to concerns over travel

North American carriers typically look at maximum durations ot 2 years, using options/collars and swaps on WTI crude, NYMEX Heating Oil and Gulf Coast Jet fuel.

Lufthansa and British Airways hedge over a 24 months horizon, while Air France/KLM hedges out to 48 months, using options, swaps, forward contracts on Brent, ICE gasoil and jet fuel for the prompt

	2005	2006	Q1/2007	Q2/2007	Q3/2007	Q4/2007	Q1/2008	Q2/2008	Q3/2008	Q4/2008	Q1/2009	Q2/2009	Q3/2009	Q4/2009	Q1/2010	Q2/2010	Q3/2010	Q4/2010
AA	8%	30%				40	24%	24%	35%	34%			33%/30%	36%				
	$54	$60				$2.27	$2.31	$2.31	$95	$82			2.53/$1.84/$2	$1.98				
	Options, Colltions, Collars					Caps							Cap/Floor/N	Net				
	WTI,HO,JeNTI,HO,Jet					WTI												
CO	<NONE>	UNK				30%	20%	5%	63%	63%	29%	29%	18%	10%				
						$2.35	$2.33	$2.47										
		Swaps				Collars	Collars	Collars					Swaps, Coll	Swaps				
		WTI, HO				HO	HO	HO										
DL	<NONE>	26%				20%	26%	31%	48%	46%			52%	39%	10%	10%	10%	10%
		$1.75				$2.35	$2.77	$2.72	$2.94	$3.42			$2.17	$2.05				
						Collars	Caps	Caps					Calls, Swapalls, Swaps					
						HO	Jet equiv	Jet equiv										
UA	<NONE>	<NONE>				18%	16%	16%	44%	47%	14%	14%	64%	64%	11%	11%	11%	11%
							$2.74 estima	.74 estima	$100-$127	$99-$134	$102-$152	$102-$152						
						three way: $1.86/$2	-way: 83/8	-way: 83/89/101					Call/Swap	Call/Swap	Call/Swap	Call/Swap	Call/Swap	Call/Swap
						HO												
US	<NONE>	32%				56%	50%	35%	58%	47%			11%	<NONE>				
						$1.85-$2.05	$68-$77	$72-$80	$97	$108								
						Collars	Collars	Collars										
						HO	HO	HO										
WN	85%	70%	60%			90%	75%	75%	80%	80%	70%	70%	70%	70%	~50%	~50%	~50%	~50%
	$26	$36				$51	$51	$51	$61	$58	$66	$66	$66	$66	~$75	~$75	~$75	~$75
	Options, Collars, s, Collars, s, Collars, Swaps						Options, Collars, Swaps				Options, Collars, Swaps		Capped	Capped				
	WTI, HO, RB(I, HO, RB(I, HO, RBOB						WTI, HO, RBOB				WTI, HO, RBOB							
AS	50%	46%					54% / 24				7% / 24							
	$30	$41					76/bbl											
							Crude, Jet											
	Options, Collars, s, Collars, s, Collars, Swaps						Options, Collars, Swaps											
AC	<50% / 24	21% / 24	13% / 24															
	Options, Swations, Swations, Swaps																	
	WTI,HO,JeNTI,HO,JeNTI,HO,Jet																	
LH							83% / 24	81%	78%	30%	80%	80%	80%	80%	61%	61%	61%	61%
							$75				$78-95	$78-95	$78-95	$78-95	$78-80	$78-80	$78-80	$78-80
							Options, Swaps				Options, Swations, Swations, Swations, Swations, Swations, Swations, Swations, Swa							
							Brent				Brent	Brent	Brent	Brent	Brent	Brent	Brent	Brent
BA	p to 24 mcp to 24 mos									80%	70%	70%	72%	68%	67%	40%	40%	40%
										$96	$95	$112	$93	$71	$77	$84	$88	$91
	Swaps, Futures, FFutures, Forwards																	
EZ	)%/12, 25%)%/12, 25%/36												75%	72%	72%	61%	61%	
													$1013/T	$769/T	$732/T			
													Swaps, Collars					
	Options, Swations, Swaps																	
RY	0-90%/12-10-90%/12-144						<NONE>	<NONE>	<NONE>	80	<NONE>	30%	90%	90%	90%	50%	50%	
										$124		$72	$620/T	$605/T	$620/T	$662/T	$741/T	
	Options, Swations, Swaps									Options, Swaps					Options, Swaps			
	Jet									Jet					Jet			
AF/KLM			83% / 48				94% / 24				72% / 48			80% / 24	76% / 24		<unwindingunwinding	
			$61				$84				$78			$76	$78			
			Options, Swaps				Options, Swaps				Options, Swaps			Options, Swations, Swaps				Op
			Brent,Gasoil,Gasoline, Jet				Brent,Gasoil,Gasoline, Jet				Brent,Gasoil,Gasoline, Jet			Brent,Gasoil,Gasoasoil,Gasoline, Jet				Brent,Ga
SAS														57%	55%	55%	46%	
														$773/T	$667/T	$680/T	$697/T	
														Options, Swaps, Collars				
CP	15%	37%	55%	55%	42%	42%												
	(targeted 33%)																	
QF	60%	100%	70%	70%	100%	100%	100%	100%	65%	65%	65%	65%						
	$49.50	$55	$70	$70	$75	$75	$75	$75	$116	$116	$116	$116						
	Options, Swaps		Options, Swaps		Options, Swaps				Options, Swaps									
	Crude, JetCrude, JetCrude, Jet				Crude, Jet				Crude, Jet									
SQ			55%	55%	55%	55%	36%	36%	36%	36%	44%	49%						
			$70	$70	$70	$70	$104-$109	$104-$109	$104-$109	$104-$109	$131	$119						
	Options, Swations, Swaps																	
	Sing-Jet	Sing-Jet																

Legend:

	AS OF DATE	
AIRLINE	64% / 24	**rule** or **reported** extent of fuel consumption hedged / maximum duration in months
	$2.05	effective fuel price realized
	collars	hedge structure
	HO	commodity basis
	(pink)	time period in court supervised restructuring

CFTC Re-Regulation of Energy Trading (NPRM issued 14JAN2010)

The ability of airlines to continue to engage in sophisticated hedging programs, as well as best practice and economics, may be influenced by a recent US Commodities Futures Trading Commission (CFTC) NPRM.

To curb speculation, CFTC proposed on January 14, 2010 setting position limits on energy futures in crude oil and refined products including heating oil, gasoline, natural gas, and jet fuel, similar to the curbs it has in place for agricultural commodities.

The proposal would restore limits that were lifted in 2001 legislation and would use the authority of the Commodity Exchange Act to set limits on contracts for futures.

Exemptions will be carved out for large energy consuming firms that hedge physical supply and costs. The proposed rulemaking includes “exemptions from the position limits for bona fide hedging transaction, including transactions or positions in a contract for future delivery on any contract market.”

The CFTC proposal sets trading limits at levels high enough that they affect only 10 firms – likely the same firms who today make hedge markets, offer trading services and take their own positions – which the agency declined to name, noting that if limits were set too low, traders would likely choose to trade offshore on unregulated markets. (A significant amount of which already takes place.)

The CFTC voted to introduce the new proposal, and it is now open for 90 days of comment before the agency takes final action.

Price volatility is caused by factors including fundamental economic conditions that drive demand, supply decisions on the part of oil-producer nations and OPEC, and the weather, in addition to financial speculation.

It remains unclear to what extent CFTC’s regulatory proposal will affect energy market volatility or overall energy market liquidity, which could adversely impact hedging premiums, economics and attractiveness.

Fuel Surcharges

Many airlines have adopted 'cost recovery' practices initiated by other consumer services firms such as utilities, communications, lodging and car rental operators, implementing surcharges as an accepted and flexible way to recover directly from passengers a portion of the impact of increasing fuel and other costs.

Fuel surcharges have generated significant amounts of revenue for airlines, partially offsetting their increasing spot fuel costs, without increases and in some cases apparent reductions to base fares. Surcharges are an easy to file and easy to use tool that create some tactical pricing advantage, but increase the cost of air travel and thus may adversely impact demand.

Added surcharges of up to $40 round-trip for peak travel days as practiced in the US domestic market are the most recent example of "spot pricing" surcharges.

Although some low fare carriers, notably Southwest and Ryanair, have largely avoided this 'cost recovery' mechanism to increase revenue, it has been widely adopted by network carriers. Passengers now incur significant fuel-related costs in addition to the basic airfare. The extent to which such surcharges are regressive impacts different groups of passengers differently.

Fuel surcharges assessed to passengers as part of filed fares are effective to a point, assuming cooperative competitive response, beyond which the increase in total out of pocket ticket price stifles more price-elastic short-haul and leisure demand (hence Southwest and Ryanair concerns) and to a lesser extent long-haul, business travel and premium fare class demand (hence BA's duration and premium fare surcharges).

In broad terms, a 1% unit revenue increase is required to offset a $3 per barrel increase in the cost of jet fuel.

Due to implementation and sales cycle lags, waivers and depressants, fuel surcharges are judged by some to be able to recover only 30-50% of the full impact of higher energy costs. A closer examination suggests the recovery rate may be greater.

Effective 13JAN2010, a passenger on United Airlines/Lufthansa making a Chicago - Frankfurt round-trip is subject to a $280 fuel surcharge, an increase of $20 since last week, despite crude prices recently coming off $83 on 11JAN2010 and declining by $5 per barrel (6%) to below $78 since then. As quantified later, a $280 "surcharge" approaches the actual cost of fuel consumed per seat-trip.

Not all airlines display/quote fuel surcharges directly; some internalize fuel costs.

For example, for an October 2009 trip from Boston to Amsterdam, Lufthansa and Northwest/KLM (prior to the Delta acquisition closing), both carriers quoted 7-day advance purchase fares on their websites of nearly the same total fare: $726 on

Lufthansa and $719 on Northwest/KLM (the $7 difference being primarily attributable to variations in passenger charges at intermediate connecting airports).

However, in the fine-print "explanation" of total fares, the two carrier websites displayed sharply different components of their total fares:

- Lufthansa quoted a base fare of $282 round-trip plus taxes/fees of $444.
- Northwest/KLM quoted a base fare $562, plus taxes/fees of $157
- Lufthansa's indicated $444 "taxes and fees" figure included a fuel surcharge of $280, plus government and airport charges totaling $164.
- Northwest/KLM's $157 "taxes and fees" figure included only government and airport charges.
- Add Lufthansa's $280 fuel surcharge to its $282 base fare, and the result is the same $562 fare that Northwest/KLM quoted.
- In reality, both carriers had the same $562 base, pre-tax-and-fee fare.

The difference: for display purposes, Lufthansa chose to split its true $562 fare into two components: an arbitrary but seemingly very attractive $282 base fare plus a not so arbitrary $280 fuel surcharge, while KLM/Northwest more transparently said its base fare was the full $562.

Why would an airline elect to split its displayed fare into an apparently artificially low base plus a high surcharge? The issue may turn on the advantage of reducing the base fare figure on which an airline pays various commissions, or to retain the ability to add after-the-fact surcharges to negotiated long-term fare contracts and concessions, or it may be a signaling and communication strategy, to consumers, corporate travel buyers, and even to other airlines.

It seems clear that Lufthansa's "real" base fare was not as low as $282 round-trip from Boston to Amsterdam. Equally clearly, if Lufthansa were to drop its $280 fuel surcharge, its base fare would certainly go up by a comparable amount.

Regulators express no concern if an airline chooses to break down its base fare into various categories for internal accounting purposes. Nothing prevents an airline from segmenting or "unbundling" its fares into a handful of components -- as long as it doesn't try to advertise its fares that way.

Much like automotive 'sticker pricing', US DOT would not object if Lufthansa were to apportion its real $562 base fare into a "low-ball" base fare of $100, plus a fuel surcharge of $280, a ground services surcharge of $50, an administrative and security surcharge of $50, and a "marketing opportunity" surcharge of $82. But in ads, promotions and fare displays, the airline must display and refer to the “real total” $562 and not "$100, plus fees and charges".

Although fuel surcharges currently represent the most significant of the unbundled charges, additions to the basic fare include not only fuel and security charges but also airport fees and government taxes as well as in some cases reservation, ticketing, form of payment-related, convenience and supplementary service fees.

Unbundling has (to the extent permitted by the industry’s electronic distribution systems, which are in flux to facilitate them) become an attractive mechanism to airlines for a number of reasons, including:

- the ability to identify, communicate and parse out a large cost factor in the price of air tickets, allowing the airline to maintain low, “lead price” fares
- the means to generate significant ancillary contributions to airline costs from passengers traveling on negotiated rate, “revenue free” or reduced-rate tickets issued under corporate travel agreements, frequent flyer programs or under employee/ID travel privileges
- possibly, the avoidance of commission and override payments to travel agents, as these are generally calculated on base fare amounts, excluding surcharges, fees and other charges
- ironically, “next generation” unbundling reflects old-time “nett” practice

The only advantage of note to passengers of unbundled charges is some modest savings for services passengers elect to opt-out from (for example, Air Canada’s refund of unused baggage allowances), and a refund of some fees if the ticket is cancelled, even if the underlying fare is non-refundable.

Fuel surcharges applied by network carriers have evolved from incremental, scalar amounts per passenger to more linear, stair-stepped, stage length or flight duration-related ‘zone charges’, such that long-haul passengers pay proportionally more than short haul passengers, commensurate with greater fuel use per passenger/seat-trip.

Widespread competitive matching has made surcharges/fees the industry’s fastest growing line of revenue since 2004, when fuel surcharges were widely introduced. Despite volatility in fuel prices since then, there has been a unidirectional, upward move in fuel surcharges, albeit with lags and stickiness.

Whereas fuel surcharges were initially modest amounts keyed to incremental fuel price exposure, more recent fuel surcharges appear to carry a significant fraction of the actual fuel expense per seat (though based on the way they are parsed out of the selling fare, at the expense of leaving a smaller residual to cover all other direct and indirect costs).

> For example, at a nominal A340-600HGW fuel burn of 6 gallons per seat-hour, an eighteen hour Lufthansa round trip (FRA-ORD) would entail 108

gallons of fuel per seat, or at $2.25 per gallon on the order of a $243 fuel expense per seat. Thus Lufthansa's $280 per passenger round-trip fuel surcharge actually manages to carry more than the total fuel cost per seat and essentially the entire fuel cost per passenger ($243 per seat divided by 90% load factor yields $270 per passenger). Hardly a "surcharge".

As noted in the earlier Boston-Amsterdam example, owing in part to competitive dynamics on domestic and international routes, US carriers have not been quite as aggressive as European carrier counterparts with fuel surcharges, choosing to maintain internalized most of their fuel costs.

This is reflected in higher basic airfares (before fees, charges and taxes are added) than those of European competitors on transatlantic routes, although the total advertised fare is very similar.

The same internalization dynamic applies in many fast growing, hotly competitive internal domestic markets, globally. Even so, United seems recently to have harmonized with Star partner Lufthansa practice, and so has Delta begun to adopt AF/KLM Skyteam practice, on ATI'd joint venture transatlantic routes.

The level of fuel surcharges discussed above, as well as the manner in which they are disclosed, may have a significant impact on demand even after airlines adjust the underlying base fares downwards.

As noted in the previous fare examples, the fuel surcharge alone appears to consumers to add considerably to the round-trip fare paid and is thus likely to trigger a demand response based on "shock and awe" if not classical economic price elasticity that differs by market and segment.

It would be difficult to apply elasticity to the increase in overall fares that are due solely to the increase in fuel surcharges and other airline-controlled fees. This is because an unknown portion of the fuel surcharge appears to be offset by a reduction in the underlying fare (Lufthansa example). Thus it will be difficult to determine the change in total fare components and in sales by fare class given the rapid flux in fares over time and the complexity of network airline Revenue Management.

Based on the disparity in surcharge parsing and display, there may also be behavioral and competitive switching by passengers observing different fuel surcharges displayed and levied in different ways by airlines serving the desired destination. There will also be some regional leisure destination-switching effects, given several carriers' variation of fuel surcharge by trip length and flight duration.

If anything, direct consumer surcharges are under-considered and under-valued in the context of financial risk management strategy and practice.

Summary and Conclusions

Airlines have strong incentives to improve the overall efficiency of their operations, the importance of fuel efficiency being driven by its top line of expense status.

Airlines will continue to use fuel hedging as a means of damping fuel price, budget variance, cash flow and earnings volatility, thus reducing beta, improving investment profile and maintaining a forward-looking image with investors.

Whereas a 12 month tenor with modest extent until the final quarter before consumption was once the norm, a long-term contango market created an opportunity to lengthen and expand hedging.

Crude oil continues to provide the greatest liquidity and opportunity for hedging, but the tendency of the crack spread to widen at times of greatest market volatility has driven hedging into refined products and crack-indexed structures.

Airlines will tend to vary the extent, duration/tenor, structure and basis of fuel hedging in response to identifiable opportunities in the deal and forward markets.

The most successful hedgers use energy data-mining, software decision support and logistics management tools to reinforce the skills sets of a small group of staff, to reduce decision cycle time and to enhance decision-making processes.

Integrating the fuel hedging and logistics functions and leveraging institutional knowledge with realtime energy market data, ‘dashboards’ and decision support enables a small group of practitioners to identify and act on opportunities to generate significant benefits, be these cost reduction, cash flow and earnings smoothing, or generate outright trading profits.

Perpetually hedging fuel in up and down markets should limit volatility but leave expected long-run cash flow and profit nearly unchanged, though damp beta in a way that the market should in theory and practice value.

- ✈ Energy price/travel demand correlation can be positive or negative
- ✈ Positively correlated when energy prices move with travel demand
- ✈ Negatively correlated when energy prices move opposite of travel demand
- ✈ Hedging is a function of macroeconomic and energy supply considerations

The objective of insurance/catastrophic/speculative hedging is protecting profits against supply disruptions or geopolitical event risk, often accompanied by a loss of business, consumer and air traveler confidence.

Benchmarking efforts and results depend entirely on the time period studied, have significant excess degrees of freedom and offer no control case.

Subject to GAAP and IFRS reporting, hedging can alter the timing of profits, which may benefit other negotiations, such as with capital providers, creditors, labor and other suppliers.

A strategy of directly outsourcing risk to consumers via surcharges is more effective than realized, under-considered and under-valued in the context of comprehensive financial risk management practice.

Appendix A

US/European/Asian Airline Benchmark Dataset

(attached as Excel filename: WIP Hedge Benchmark Worksheet.xls)

Hedge Effectiveness Benchmarking

The hedging function (be it fuel, interest rates, or foreign exchange) is typically housed within Treasury function for its focus on analytics and derivatives.

Fuel logistics and purchasing can be integrated with corporate supply chain (ERP), or a subsidiary of the Treasury hedging group, depending on skills sets.

Performance measures typically center on service levels, inventory levels and carrying costs, cost savings against budget, and transaction efficiency and accuracy.

- ✈ Objective? Which results metric to hedge? Budget, cash flow, margin?
- ✈ How to measure effectiveness? Budget variance, liquidity, EPS, EV?

Quantification:

- ✈ Convert uplift to contract size; use forward curve, 95% confidence interval
- ✈ Calculate Enterprise Value at Risk (EVaR) across range of extents, tenors
- ✈ Variables: (range of) Extent, Tenor/holding period (day/week/month/year).
- ✈ Define: Net risk = (Budget Risk) less (Financial Risk)

Evaluate outcome of management policy alternatives:

- ✈ No hedging: full exposure to fuel price volatility
- ✈ Static: fixed term portfolio entered into based on indices
- ✈ Dynamic: active management of a rolling portfolio based on market conditions
- ✈ Speculative: active, portfolio profit seeking (i.e. trading for own account)

Basis of interest: jet fuel indexed to crude with fixed crack spread; greater liquidity than jet-indexed basis, tames covariance of crack spread with crude

Benchmarks: net benefits attributed to hedging, operating income/margins, cash flow stability, beta, EPS, Enterprise Value

Appendix B

Comments on Airline Hedging Policies and Benchmarking

Lufthansa Management Discussion

Lufthansa
Creditor Info 01|08 (May 2008)

Financial Topics: Fuel hedging at Lufthansa

The Lufthansa Group's annual fuel consumption amounts to some 8.3 million tonnes of kerosene. It is a major item of expense, making up around 17 per cent of operating expenses for the Group, even though Lufthansa is far less dependent on oil prices than its competitors. Severe fluctuations in fuel prices can have a considerable effect on the operating result. In order to reduce these fluctuations Lufthansa applies a rule-based fuel price hedging with a time horizon of 24 months.

Hedging transactions are predominantly for crude oil, because the price differential between kerosene and crude oil cannot be effectively hedged due to the illiquid market. Lufthansa uses standard market instruments such as forward contracts and options for its fuel price hedges. With a lead time of 24 months Lufthansa hedges 4.8 per cent of planned consumption per month, up to a hedging level of 85 per cent. The six months following a given date are then hedged to 85 per cent. The hedging transactions are, therefore, based on fixed rules and generate the average of crude oil prices over time.

At the end of the first quarter of 2008, there were crude oil hedges for 83 per cent of the forecast fuel consumption for 2008, for the year 2009 around 35 per cent of the forecast fuel requirement was hedged. If fuel prices were to change further, Lufthansa's expenses for fuel for the respective year would change by a smaller percentage because of the existing hedges. The fuel surcharge has established itself in the market as a further means of coping with fuel price increases.

"LH Sustainability" -- Hedging Policy Discussion (2007 Annual Report)

Development of fuel costs

For airlines, their expenditure for kerosene represents a significant cost factor. This expense has increased considerably over the past few years, as the price of crude oil has risen continuously. While the record high in 2006 lay at 78.40 US-dollars per barrel (159 liters), the high for the year in 2007 was reached on November 21 at 99.29 US-dollars. In 2008, the price of crude oil has already passed the mark of 138 US-dollars on several occasions. Significant changes in fuel prices can have a considerable influence on the Group's operational result. In 2007 alone, the increased price of oil caused additional costs of 363 million euros for the Group. However, a weak US-dollar in comparison to the euro and price-hedging measures compensated for this price increase almost entirely. In the framework of its hedging policy, the Group counts on period-based fuel-cost hedging with a time horizon of 24 months. Five percent of the planned quantity of fuel is hedged per month – up to a hedging level of 90 percent.

Lufthansa Policy Comments in ACCA Presentation (Singapore, 2003)

Corporate Risk Management Lufthansa

- Energy Risk Manager of the Year:Enduser – Energy+Power Risk Management

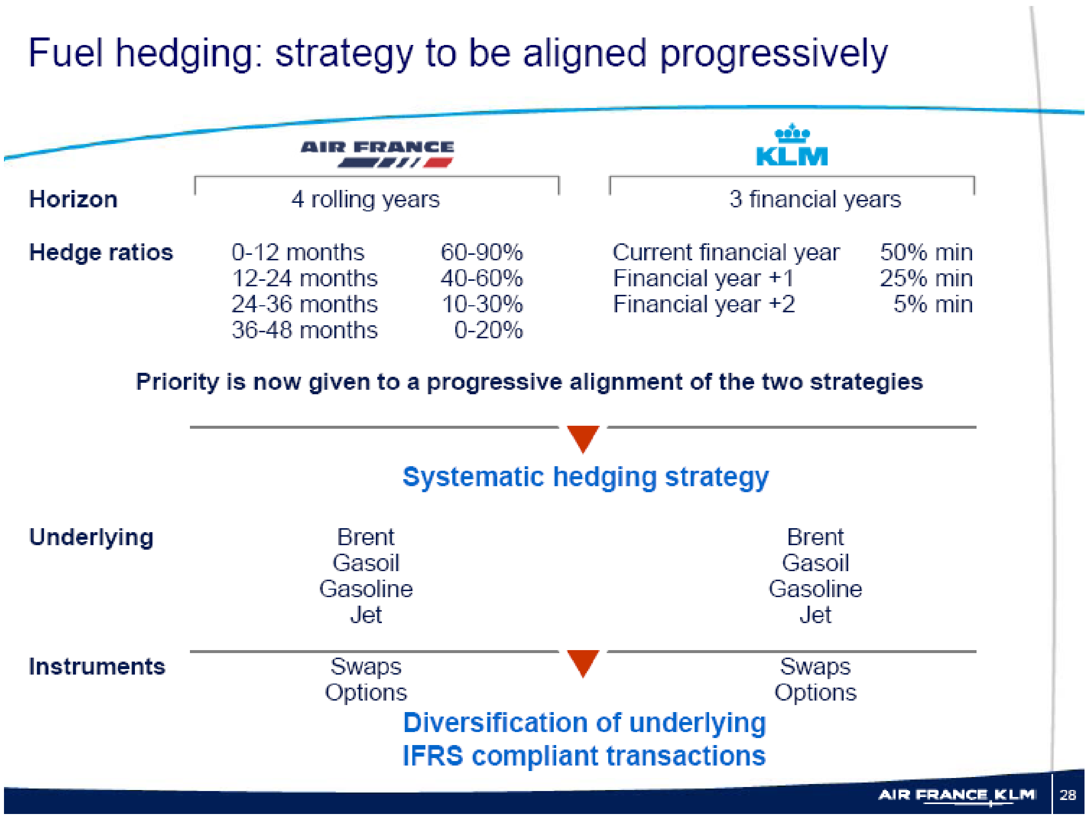
- Began hedging jet fuel in 1990 before the 1st Gulf War
- Now hedges 90% fuel requirements, 18 – 24 months ahead
  - "A **successful fuel-hedging programme** is simply one that accomplishes its hedge objectives, **like systematic reduction of risk**, catastrophe insurance or budget protection." -- Helmut Fredrich, general manager of corporate fuel management

- Uses a variety of hedging / risk management techniques
  - "With the high prices prevailing, the downside risk is very high, so we use two or three-way option structures, this way we don't have 100% coverage3 on the upside." -- Fredrich
  - "We hedge the products that are most feasible at the time:
    - **we start with crude, because of the liquidity.**
    - Kerosene is not that liquid, and if you want to hedge 18 months forward you pay a high premium – so we'll start with crude and then roll on to gas oil and jet fuel as appropriate." – Fredrich

- Jet-fuel hedging team highly coordinated with risk management operations
  - "All our exposure is in USD, **so all our positions on the physical and derivatives side are reported and put into the financial system**, so (the currency team) always knows the position and can do its own hedges accordingly." – Fredrich

AF/KLM Investor Day Presentation (9/26/2006)

Suggested that at that time, confirmed by filings, that Air France held positions for up to four years, and KLM three years into the future, each composed of IFRS compliant swaps and options on Brent, ICE gasoil, gasoline and Jet.



More recently, in view of poor hedging experience during 2008-2009, AF/KLM have scaled back its extent of hedging and shortened its horizon to 24 months.

Without a doubt, the $6.8 billion notional value of the AF/KLM hedge portfolio as of September 2006, as well as projected savings declined significantly from July 2008.

An efficient fuel hedging policy

	2006-07	2007-08	2008-09
Consumption hedged	**83%**	55%	30%
Jet fuel market price* (in $/t)	**$674**	$702	$696
Brent market price* (in $/bl)	**$68**	$68	$68
AF-KLM hedge price	**$52**	$58	$54
AF-KLM final purchase price (in $/bl) (physical + hedging)	**$54**	$62	$63
Hedging gains (in $bn)	**0.99**	0.46	0.37
Expense after hedging (in $bn)	**5.40**	6.40	6.70

* Futures prices as at 29th September 2006

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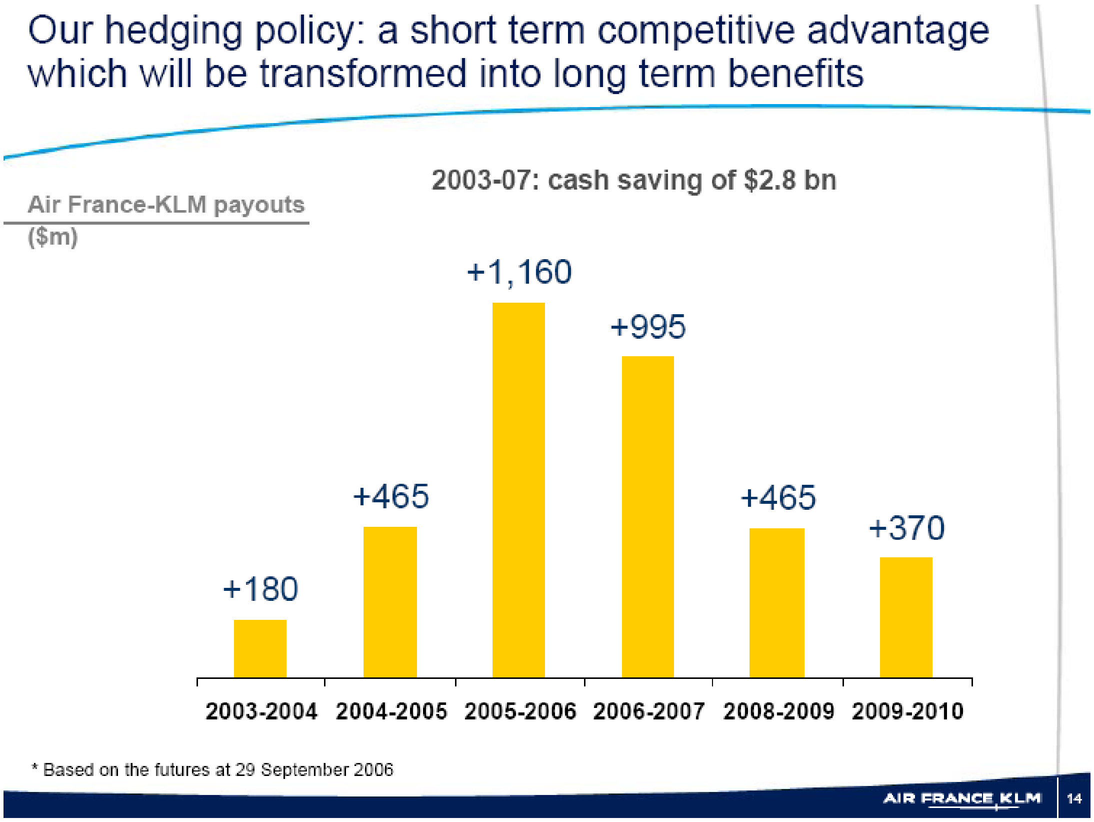
Risk management is at the heart of our business

- RMC includes the COO and CFO of both companies
- RMC meets quarterly and decides on hedging and its different durations
  - Multi-year for fuel, foreign currency investments and interest rate risk
  - Annual operating income currency risk
  - Targets for hedging ratios, deadlines to meet these targets and the preferred types of hedging instrument

AIR FRANCE KLM 23



Our hedging policy: a short term competitive advantage which will be transformed into long term benefits
2003-07: cash saving of $2.8 bn
Air France-KLM payouts
($m)
+180
+465
+1,160
+995
+465
+370
2003-2004
2004-2005
2005-2006
2006-2007
2008-2009
2009-2010
* Based on the futures at 29 September 2006
AIR FRANCE KLM
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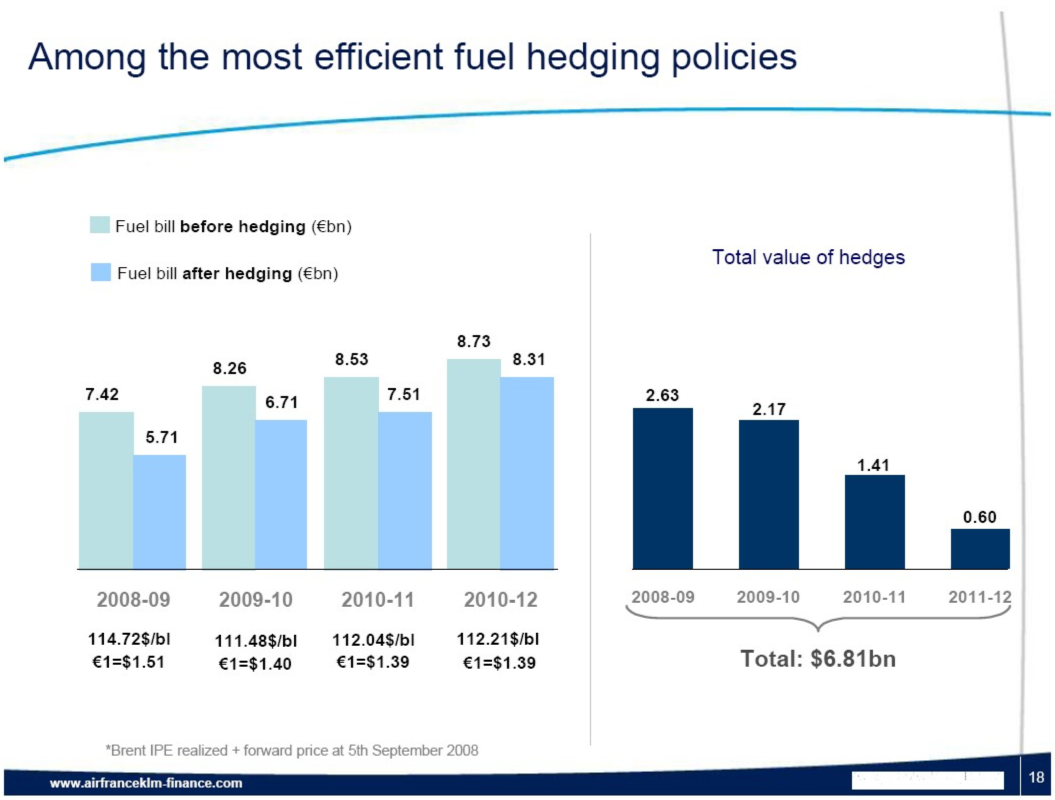

Among the most efficient fuel hedging policies
Fuel bill before hedging (€bn)
Fuel bill after hedging (€bn)
7.42
5.71
8.26
6.71
8.53
7.51
8.73
8.31
2008-09
2009-10
2010-11
2010-12
114.72$/bl
€1=$1.51
111.48$/bl
€1=$1.40
112.04$/bl
€1=$1.39
112.21$/bl
€1=$1.39
Total value of hedges
2.63
2.17
1.41
0.60
2008-09
2009-10
2010-11
2011-12
Total: $6.81bn
*Brent IPE realized + forward price at 5th September 2008
www.airfranceklm-finance.com
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Exane BNP Paribas Comment on AF/KLM Hedging (20 November 2007)
(Note: precedes market top and decline in July 2008)

Valuation risks

… There is also the threat of a much higher level of jet fuel prices, and as noted we have raised our cost estimates for 2008/09 and onwards to take account of this. However, these are chiefly short/medium-term earnings risks that apply to all airlines. As noted, Air France-KLM has a highly protective hedge in place through 2007/08 and lower, but still significant, levels of hedging that are higher than those of competitors for 2008/09 and 2009/10. … We believe the fuel price risk is factored into the shares' current valuation and the valuation discount has been overstated.

Fuel costs: hedging continues to contain costs

Air France-KLM is one of the best hedged airlines in Europe and benefits from the decision to replace a large part of the long-haul fleet earlier than its peers.

Table 19: Fuel hedging and cost profile

Component	07/08e	08/09e	09/10e	10/11e
Brent (USD/barrel)	81	88	84	82
Jet fuel new CIF (USD/ton)	791	855	820	801
Consumption (000 m3)	11,573	11,983	12,456	12,813
% of consumption hedged	78	67	51	31
Average hedge price (USD/ton)	61	60	67	68
Final cost (USD/barrel)	66	69	75	78
Cost before hedge (USDbn)	7.5	8.5	8.5	8.6
Cost after hedge (USDbn)	6.4	7.1	7.8	8.2

Note: data are at 9 November 2007

Source: Company, Exane BNP Paribas estimates

This will continue going forward, since hedge positions are increased opportunistically when the crude price dips and thus we are looking at dynamic and not static positions.

The latest fuel hedge figures show that Air France-KLM is 78% hedged for the current year at an average hedge price of USD61/bbl (final price of USD66/bbl). However, we are at very early days in respect of hedging cover and the company will opportunistically add to the positions on any oil price weakness. We estimate that fuel expenses should rise from USD6.3bn reported in 2006/07 to USD6.4bn (+8%) in 2007/08 and USD7.1bn (+9%) in 2008/09, all at around USD81/bbl Brent crude equivalent. This remains one of the best levels of hedge cover among the European airlines and the hedged fuel cost estimates are already in our forecasts. Fuel consumption per passenger is also significantly reduced because of the fleet upgrades in the past few years, focused in the long-haul segment, mainly on the introduction of B777-300s.

Also offsetting the additional fuel costs are the merger synergy effects, ongoing cost cutting in each operating company and, in particular, the very powerful effect of high average seat load factors on asset utilisation (at around 83.84%, Air France-KLM's average seat load factors are approximately 4.5 points higher than BA and 6 points higher than Lufthansa. This needs to be adjusted for the higher proportion of short-haul aircraft in Lufthansa's fleet but the difference with BA is marked, since BA has a proportionately higher long-haul fleet although it is significantly smaller than Air France-KLM in terms of actual aircraft numbers). Air France-KLM also benefits strongly from the weakness of the US dollar.

Alaska Airlines Management Discussion (SEC Form 10-K, 2008)

Fuel Hedging

We utilize primarily crude oil call options to decrease our exposure to the volatility of jet fuel prices, although we do have some collar structures that are scheduled to settle in 2009. The total outstanding liability for the collar contracts at December 31, 2008 is approximately $24 million, and we currently do not have any collateral on deposit with counterparties to these agreements. With call option contracts, we benefit from the decline in crude oil prices, as there is no future cash exposure above the premiums that we pay to enter into the contracts.

In the fourth quarter of 2008, we restructured our hedge portfolio to take advantage of lower fuel prices. We were able to reduce our 2009 average strike price from $103 per barrel at the end of the third quarter of 2008 to $76 per barrel for 50% of the planned 2009 consumption. As part of this restructuring effort, we terminated some of the previously held contracts. We realized losses on the termination of these contracts of $41.5 million and $8.5 million at Alaska and Horizon, respectively, representing the difference between the original premiums paid to purchase those contracts and the cash received from the counterparty upon termination. We believe that restructuring the hedge portfolio was a wise use of our resources and consistent with our stated objective of managing volatility.

Southwest Airlines

Initiated by then CFO Gary Kelly in 1999, Southwest's extensive, long-tenor hedging program, run by one, later three staff members, benefited cumulative earnings by more than $3 billion over the period 2002-2008.

Southwest hedging strategy and practice has been subject of numerous academic studies that conclude airline fuel hedging creates enterprise value, reduces beta, and allows carriers to avoid the pitfalls of chronic underinvestment.

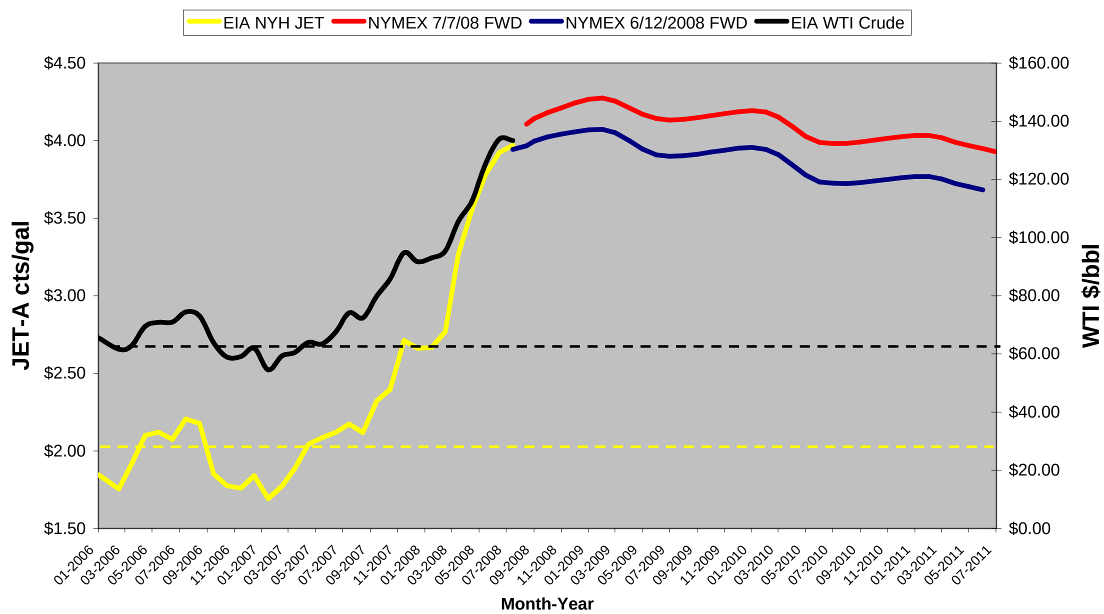
Corporate Risk Management
Southwest Airlines – 2nd half 2000

- Jet-fuel – typically 2nd largest expense after employees
- Gary Kelly, CFO made the call to hedge 100% of Southwest's jet-fuel needs for the 3rd & 4th quarters (2000)
- 1bn gallons of jet fuel per year, rarely hedged more than 20-30% previously
  - "I think airlines have more refined strategies today than they did years ago, this current environment begs for some different approach than what we were using in the past." – Kelly
- No futures contract for jet fuel – Bought contracts locking in prices for crude and heating oil
- Also protected itself with buying call options that would allow it to buy crude at lower fixed prices than its locked in price
- Covered energy price needs equivalent to $23/bbl Crude for 2nd half
- Oil prices soared to $30+/bbl
  - *"We came to grips at the beginning of the year that we were faced with a prolonged shortage of crude. We thought that any price in the low 20s (per bbl of oil) was a good one." -- Kelly*
- Cost saving of over $100mm ($43mm in 3rd qtr and approx $60mm in 4th qtr)

Corporate Risk Management
Southwest Airlines -- 2003

- Southwest Airlines' 1st quarter profits rose 14%, rivals reported losses due to capacity issues and high oil costs
- "Significantly offset higher energy costs by hedging"
  - 100% of 1st qtr fuel requirements – saving $77mm pre-tax
  - 100% hedged 2nd qtr around $24/bbl
  - 85% hedged 2nd half at caps <$24/bbl
- Southwest uses a range of hedging techniques and instruments
- Resources & expertise upgrade
  - from 1 part-time employee to hedge 20-30% of fuel needs to 3 full-time internal finance staff + outside industry experts

EIA WTI, NY Harbor Jet-K and NYMEX HO Forward Curve as of June/July 2008



EIA NY Harbor Jet-K and NYMEX HO Forward Curve as Proxy for JET-K