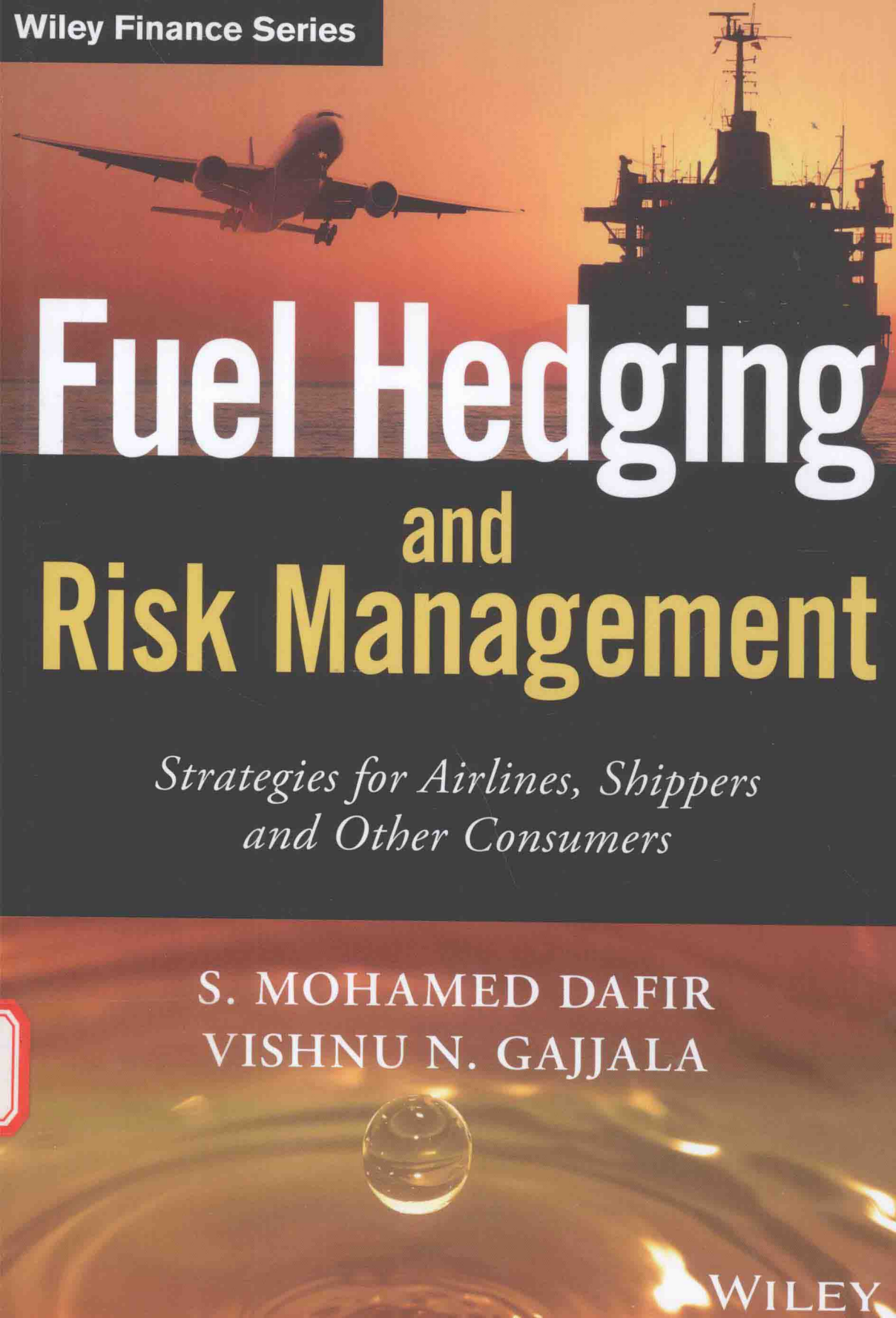


Wiley Finance Series



# Fuel Hedging and Risk Management

*Strategies for Airlines, Shippers  
and Other Consumers*

S. MOHAMED DAFIR  
VISHNU N. GAJJALA

WILEY

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*To my dear parents, Lin Yi, and my nieces, princesses Malak, Omayma, Myriam, and Asma, without forgetting Captain Zachary Yacin and all the family Dafir.*  
- S.M.D.

*To my parents, Sairoopa and Prasad.*  
- V.G.

# Preface

*“The day the hippopotamus left the pool...”*

If you had asked me 15 years ago what kind of book I would have liked to write, my answer would have been philosophy, politics, or poetry. I never would have imagined that the day would come that would find me writing about a topic such as fuel oils: substances still associated with childhood memories of images of oiled seabirds or with the smell of gasoline that instantly calls to mind car sickness.

But if you were to next ask me why I have written a book about fuel hedging, the first answer that might come to my mind would be because I am good at it and that experience has shown me that there are so many people out there who would benefit from learning about it, otherwise remaining disadvantaged and at the mercy of ruthless and sophisticated fuel derivatives practitioners. After giving the question a second thought, I might realize that I shouldn't try to protect any party. After all, there are, there have been, and there will always be fat cats and hungry dogs in this world. My subsequent answer would be that by writing this book, I might be unconsciously trying to defend the truth that this practice has merit, that there is a science behind it, and that mishaps of the past should in no way diminish fuel risk management techniques, but rather reveal the omissions of the unvigilant, the mistakes of the careless, and the incompetence of charlatans.

In 2013, when I first got in touch with Wiley, my intention was to write a book about commodity derivatives. But after long discussions with Vishnu, it became clear to us that a book focused on fuel hedging would be particularly useful. Vishnu Gajjala is not only my coauthor; Vishnu and I worked together in commodities structuring for seven years and because of that, I know Vishnu has a unique blend of expertise, discipline, and patience – essential to writing an outstanding book. We also share the hope that this book will serve as a continuing encouragement, reminder, and, when necessary, an exhortation for fuel hedging practitioners to think off the beaten path. We made it to this finish line together, and I cannot imagine going through this book-writing journey with anyone else.

During the time it took to write the book, many market and geopolitical events unraveled, impacting the energy market landscape. It was therefore important to refrain from chasing events but rather to focus on how to help the reader anticipate and participate in the dynamic energy market. This exercise was equally enriching for me, especially due to the warm discussions that I had with people close to me who were interested in knowing more about the book and the rationale behind it.

After Rab Arous, a friend of mine, once asked me how I had ended up working in this field, my candid answer was that the smell of the petrodollar might not be as bad as that of petrol. By indexing the compensation for protection and security of trade routes to the most traded commodity, the petrodollar system allows the smooth projection of power, oiling rusty human relationships. Having played a central role in the geopolitics of the last 30 years, oil has not only become an underlying reason for many territorial conflicts, but also a means of coercion and pressure. This was remarked on by President Vladimir Putin in the midst of the Ukrainian crisis and spectacular decline of oil prices, when he stated that “A political component is always present in oil prices. Furthermore, at some moments of crisis it starts to feel like it is the politics that prevails in the pricing of energy resources.” The use of this perception of oil to justify economic war could only sound legitimate in light of the statement made by President Reagan’s son, who, in March 2014, said, “Since selling oil was the source of the Kremlin’s wealth, my father got the Saudis to flood the market with cheap oil... Lower oil prices devalued the ruble, causing the USSR to go bankrupt, which led to perestroika and Mikhail Gorbachev and the collapse of the Soviet Empire.” Even though such an unverified claim might not provide a complete explanation of the fall in oil prices back then, there is a strong sentiment that even the recent change of tack on oil prices by Gulf States was designed to use oil prices to pressurize Iran and Russia to come to the bargaining table.

My discussion with Mr Arous began with a simple question, which quickly developed into an interesting conversation, a part of which is worth recounting here.

*R. Arous* Why are you focusing on oil consumers, given that the drivers and factors impacting the supply side of the equation sound more exciting and thrilling, especially when combined with the geopolitics of trade routes and maritime security?

*S.M. Dafir* When all is said and done, it is the consumer who pays for the consumed good, thereby providing the fundamental incentive for producers to produce. Furthermore, consumers can consolidate market power with the help of regulations or legislation, like consumer protection laws that aim to defend the bargaining power of end consumers in recognition of their political power as potential voters. The same applies to the demand for a book, as there are more consumers than producers interested in a book about fuel risk management. Quite often, we hear friends, taxi drivers, or even restaurant owners complaining about high oil prices or justifying the high cost of their services. However, we seldom hear any feedback from these same people when oil prices collapse, save when they have fuel hedges in place and become very vocal about any associated financial losses.

*R. Arous* Isn’t that how hedging mechanisms work?

*S.M. Dafir* Yes, but when a risk manager takes credit for the positive payout of a hedge that he/she has put in place, he/she should also accept blame for future negative payouts. So many risk managers praise themselves for the market timing of their hedges and seek appropriate recognition from senior management. It is a very common human behavior to take credit for good luck and associate it with skill, while negative outcomes are usually explained by bad luck. In financial markets, losses are very often blamed on “volatility,” but high profits from price spikes are usually presented as good market timing.

For example, take the spectacular decline of oil prices witnessed in 2008. Many Asian airlines reported significant losses on fuel hedging derivatives, eliciting strong reactions from top management, tremendous concern from banks about the risk of default on hedging derivatives, and a tsunami of bad publicity

regarding structured hedging derivatives. It was very easy back then for any layperson to raise his or her voice and designate structured and exotic derivatives as too complex, warranting their avoidance or even prohibition, as if complexity could be accepted as reasonable grounds for culpability. That was an easy way out for many stakeholders. However, the recent dramatic decline of oil (2014–15) amounted to a replay of past events that proved how the allegations made in 2008–9 overlooked the underlying culprit behind the unfortunate mishaps. In other words, the last five years of change in airlines' hedging policies, which were designed to avoid complex exotic and structured products, could not prevent large losses in 2015. Unfortunately, the media and many so-called experts have been recycling the same narrative of the past as if the market suffers from amnesia.

*R. Arous* When money is lost, people need an “acceptable” explanation and a scapegoat. Isn't it the same here?

*S.M. Dafir* Yes. This is no different from how the concept of witchcraft was used to identify scapegoats for natural disasters or newborn malformation. For some religious leaders to reconcile the concepts of omnipotence and an all-loving deity, they might have invented “witches” in order to explain the existence of evil.

The recent decline of oil prices was good news for the airline industry, although many airlines reported big realized/expected losses from fuel hedges in 2015, including Southwest Airlines (over \$1 billion), Cathay Pacific (over HK\$3 billion), Singapore Airlines, and Delta Airlines. The problem is that without hedging, you can always blame the market, but if you make losses because of your hedging, then it is your fault. As I explained earlier, this is only fair if a risk manager chooses to take credit for the hedging gains without considering the performance of the business as a whole. In fact, those airlines that had fuel hedges in place saw this benefit muted by hedging losses. In my opinion, what is commonly perceived as evil is nothing but the absence of good, in the same way that blindness is the absence of sight and deafness is the absence of hearing. Those who describe these risk management instruments as “casino-like hedges” show a profound misunderstanding of how financial markets and price discovery mechanisms work. They fail to accept that, in the absence of value creation, one person's gain is another person's loss. When fuel prices keep rising, those who make money, including producers, investors, speculators, and even certain hedgers, make huge gains that must come from someone else. When these gains are not reinserted into the economy in the form of consumption, a transfer of wealth takes place. One party in the economic equation will experience financial bleeding that can't be sustained forever. When such status quo gets challenged, extreme and rough events occur!

*R. Arous* Are you referring to mean reversion?

*S.M. Dafir* In a sense, yes. Mean reversion might reflect the rebalancing of the distribution of value that is finite. Let me tell you a story. My father visited me once and kept himself happily engaged taking care of the potted plants on the roof terrace. Among the things he planted was a pumpkin seed, which grew quickly into a pumpkin tree and even bore small fruit. My dad was so excited and enthusiastic that he started telling me how we would no longer need to buy pumpkins from the supermarket. That was until I reminded him that the tree that he expected to produce a dozen pumpkins was planted in a small pot not even the size of one ripe pumpkin!

- R. Arous* But you could still add more soil and water to sustain its growth.
- S.M. Dafir* Exactly! That is precisely what happens with rising oil prices. Increasing debt makes energy products affordable and allows the economy to continue to grow. Without debt, oil prices would plummet. Similar to the potted pumpkin tree, recycling the petrodollar helps reinject some of the liquidity through a well-functioning financial system. However, if the outstanding credit drops, growth gets impacted and oil prices plummet. Quantitative easing was nothing but a response to this phenomenon.
- R. Arous* What about volatility?
- S.M. Dafir* In my opinion, volatility spikes are akin to revolutions; they are prompted by a demand for decorrelation, regime change, or a more equitable division of created wealth. For example, a sharp decline in the price of oil has the effect of boosting consumers' spending. Unfortunately, just as with the case of revolutions, volatility spikes are usually more profitable for those who possess solid capabilities, information, and resources. For example, in the commodities market, falling prices are usually accompanied by a futures market in "contango" (steep forward curve) that offers arbitrageurs the opportunity to buy the physical commodity, store it, and secure a high selling price in the future. However, weak players might not have the access to funds and storage facilities to execute this. Even worse, they might struggle to meet margin requirements on their existing hedges or derivatives. Short of funds, many fuel hedgers are obliged to early-terminate their hedging trades at unfavorable exit levels. This book dedicates an entire chapter to discussing unwanted risks associated with fuel hedging to help hedgers learn how to assess risks, negotiate ISDA and CSA, and formulate solid strategies to harness volatility.
- R. Arous* You explained earlier how macroeconomic and geopolitical factors affect oil prices. Can't fuel hedgers focus on these macro factors in order to anticipate and navigate volatility?
- S.M. Dafir* That is not enough. The macroscopic and the microscopic are intertwined. The more we learn about the macro picture, the better we understand the microscopic details and vice versa. Take for example the pricing models of derivatives; they are based on our understanding of the dynamics of price movement, which includes mean reversion, regime changes, correlations, and other assumptions borrowed from our knowledge at the macroeconomic level. At the same time, knowledge of derivatives' valuation, risk management, and collateralization helps us understand the market reaction to price movement, triggers of liquidity drainage and credit crunches, and the impact of derivatives replications on the price determination process.
- During the five years preceding the peak of the credit crisis and the collapse of Lehman Brothers, commodities markets witnessed a phenomenal development of financial commodity products giving birth to innovative solutions, some of which were borrowed from other asset classes. Unfortunately, much of the accumulated experience and know-how seems to have been lost during the years following the credit crisis, which was capitalized upon by some participants to start a witch-hunt regarding structured derivatives products. During the same period, many experienced commodities derivatives practitioners left the field to pursue other interests. Hopefully, this book will help record some of the know-how and lessons learned, making them available for people to come.



- R. Arous* I understand that there is a lot to comprehend from past experiences in commodities derivatives and derivatives in general. But, the biggest risks might not be a replay of the past. What is the market uncertainty that concerns you the most?
- S.M. Dafir* Mehdi Elmandjra once said, "The illiterate of today is one who does not know how to unlearn in order to learn how to learn again."

\*\*\*\*\*

Let me tell you my little story about the "hippopotamus." There was once a man named BenBer who lived in a huge villa. As a fan of animals, he even kept a hippopotamus in his pool. He was fond of seeing that other smaller animals, such as ducks, cohabited together and shared the same pool.

One morning, BenBer woke up to the surprise that the hippopotamus had left the pool and disappeared. As a result, the water level decreased significantly. Worried about the survival of the animals that became exposed, BenBer rushed to his hose and kept pouring water into the pool until it reached its usual level. Thanks to BenBer's rescue operation, most of the animals remaining in the pool survived...

... **But what if the hippopotamus comes back?**

S. MOHAMED DAFIR

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S. MOHAMED DAFIR

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VISHNU N. GAJJALA

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