

## **Metallgesellschaft AG: A Case Study**

By John Digenan, Dan Felson, Robert Kelly and Ann Wiemert

*In December, 1993, Metallgesellschaft AG revealed publicly that its "Energy Group" was responsible for losses of approximately \$1.5 billion, due mainly to cash-flow problems resulting from large oil forward contracts it had written. In a lucid discussion of this infamous derivatives debacle, Digenan, Felson, Kelly and Wiemart explore the trading strategies employed by the conglomerate, how proper supervision could have averted disaster and how similar financial crises may be avoided in the future.*

### **Background**

Metallgesellschaft AG, or MG, is a German conglomerate, owned largely by Deutsche Bank AG, the Dresdner Bank AG, Daimler-Benz, Allianz, and the Kuwait Investment Authority. MG, a traditional metal company, has evolved in the last four years into a provider of risk management services. They have several subsidiaries in its "Energy Group", with MG Refining and Marketing Inc. (MGRW) in charge of refining and marketing petroleum products in the U.S.[1] In December, 1993, it was revealed publicly that the "Energy Group" was responsible for losses of approximately \$1.5 billion. MGRM's expanded venture into the derivatives world began in 1991 with the hiring of Mr. Arthur Benson from Louis Dreyfus Energy. It was Benson's strategy that eventually contributed to the massive cash flow crisis that MG experienced.

### **The Deals:**

MGRM committed to sell, at prices fixed in 1992, certain amounts of petroleum every month for up to 10 years. These contracts initially proved to be very successful since it guaranteed a price over the current spot. In some cases the profit margin was around \$5 per barrel. By September of 1993, MGRM had sold forward contracts amounting to the equivalent of 160 million barrels. What was so unique about these deals was that the vast majority of these contracts contained an "option" clause which enabled the counterparties to terminate the contracts early if the front-month New York Mercantile Exchange (NYMEX) futures contract was greater than the fixed price at which MGRM was selling the oil product. If the buyer exercised this option, MGRM would be required to pay in cash one-half of the difference between the futures price and the fixed prices times the total volume remaining to be delivered on the contract. This option would be attractive to a customer if they were in financial distress or simply no longer needed the oil. The sell-back option was not always an option, because MGRM sometimes amended its contracts to terminate automatically if the front-month futures price rose above a specified "exit price".[2]

### **The MGRM Strategy:**

MGRM provided their customers with a method that enabled the customer to shift or eliminate some of their oil price risk. The petroleum market is an environment plagued with large fluctuations in the price of oil related products. MGRM believed their financial resources gave them the ability to wholesale and manage risk transference in the most efficient manner. In fact, MGRM's promotional literature boasts about this efficiency at risk management as a key objective to continued growth in acquiring additional business. MGRM's hedge strategy to manage spot price risk was to use the front-end month futures contracts on the NYMEX. MGRM employed a "stack" hedging strategy. It placed the entire hedge in shortdated delivery months, rather than spreading this amount over many, longer-dated, delivery months because the call options mentioned above were tied to the front month futures contract at the NYMEX. Studies have demonstrated the effectiveness of using stacked hedging. MGRM's strategy was sound from an economic standpoint.

The futures contracts MGRM used to hedge were the unleaded gasoline and the No. 2 heating oil. MGRM also held an amount of West Texas Intermediate sweet crude contracts. MGRM went long in the futures and entered into OTC energy swap agreements to receive floating and pay fixed energy prices. According to the NYMEX, MGRM held the futures position equivalent of 55 million barrels of gasoline and heating oil. By deduction, their swap positions may have accounted for as much as 110 million barrels to completely hedge their forward contracts.[3] The swap positions introduced credit risk for MGRM.

### **What Went Wrong:**

The assumption of economies of scale was mistaken. MGRM attributed to such a great percentage of the total open interest on the NYMEX that liquidation of their position was problematic. Without adequate funding in case of immediate margin calls, this seemingly sound strategy becomes reckless. MGRM's forward supply contracts left them in a vulnerable position to rising oil prices. Therefore, MGRM decided to hedge away the risk of rising prices as described. However, it was the decline in the price of oil that ultimately led MGRM to financial distress.

Another problem MGRM encountered was the timing of cash flows required to maintain the hedge. Over the entire life of the hedge, these cash flows would have balanced out. MG's problem was a lack of necessary funds needed to maintain their position. Given the fact that this risk management strategy played a key role in acquiring business pursuant to their corporate objectives, management should have obtained an understanding of the strategy. Did MG's Supervisory Board really know what was going on?

### **Analysis of MGRM's Methods:**

MG's losses in the futures and swaps markets have raised questions about whether MG was really hedging or speculating. When news of MG's

losses began to leak to the public, it was rumored that they had speculated, betting that oil prices would rise. If they were hedging, as initially reported in the press, they would be indifferent to a change in prices. MGRM was not indifferent to the direction of oil price movements because they were engaged in an indirect hedge of their forward positions.

The enormous losses they incurred did not result from naked futures positions in which MGRM gambled that the price of oil would rise. The position was more complex than that. MGRM's futures and swaps positions were hedges of the medium-term fixed-rate oil products they had sold forward. The hedge scenarios were as follows: If oil prices drop, the hedge loses money and the fixed-rate position increases in value. If oil prices rise, the hedge gains offset the fixed-rate position losses. A hedge is supposed to transfer market risk, not increase it. If this were a hedge, as we have proposed, we must answer the question: how did MG lose over \$1 billion?

MGRM's hedge adequately transferred its market risk. When oil prices dropped, they lost money on their hedge positions but the value of their forward contracts increased. MGRM exposed themselves to funding risk by entering into these positions. In that sense, they were speculating. They were speculating by entering into medium-term fixed-rate forward positions totaling approximately 160 million barrels of oil. The sheer size of this position created an enormous amount of risk. According to an MG spokesperson, this position was the equivalent of 85 days worth of the entire oil output of Kuwait. If oil prices were to drop, MGRM would lose money on their hedge positions and would receive margin calls on their futures positions. Although gains in the forward contract positions would offset the hedge losses, a negative cash flow would occur in the short run because no cash would be received for the gain in the value of the forward contracts until the oil was sold. Although no economic loss would occur because of their hedge strategy, the size of their position created a funding crisis.

### **From Backwardation to Contango:**

Another issue compounding MG's crisis is the shift of the oil market from normal backwardation to contango. In the oil futures market, the spot price is normally greater than the futures price. When this occurs, the market is said to be in backwardation. When, however, the market shifts and futures prices are greater than the spot price, the market is said to be in contango. Since MGRM was long futures, the contango market created rollover losses that were unrecoverable. MGRM entered into "stacked" futures positions in the front month contracts and then rolled its position forward at the expiration of each contract. In the contango market, the spot decreased more than the futures prices. As long as the market stayed in contango, MGRM continued to lose on the rollover.

It would not be accurate, however, to say that Benson's gamble on a market in normal backwardation created MGRM's dire cash flow crisis.

The contango market compounded MGRM's problem but their real problem was created by their inability to handle the cash flow problems created by the drop in oil prices in conjunction with the huge volume of futures contracts they entered into. The rollover risk that the oil market might go into contango should have been factored into the price of the call options within MGRM's forward fixed-rate contracts. The contango market simply meant the market was at full carry. The contango market did not make their hedge a bad hedge. It simply compounded their cash flow crunch. It has been widely reported in the press that the contango market was the key to MGRM's downfall. We agree that the contango market played a role in the crisis. We disagree that it was the key element.

If the market had stayed in normal backwardation, as Benson expected it would, MGRM would actually have picked up a gain on the rollover of their hedge positions. In the particular case of crude oil, the backwardation can be considered the market's judgment that OPEC's cartel pricing was unsustainable over the long run and prices would some day collapse. As OPEC managers became deadlocked on reaching production quotas in late 1993, the spot price tumbled in accordance with the expectations reflected in the inverted market and oil markets moved from backwardation to a strong carry[4]. MGRM's rollover gains turned into rollover losses. The rollover loss that resulted from the contango market was the only real economic loss suffered by MGRM. By this, we mean that the rollover loss was unrecoverable and was not offset by another position.

### **U.S. vs. German Accounting Methodologies:**

German accounting standards also compounded MG's problems. Lower of Cost or Market (LCM) accounting is required in Germany. In the U. S., MGRM met the requirements of a hedge and received hedge accounting. Therefore, in the U.S., MGRM actually showed a profit. Their hedge losses were deferred because they offset the gains of their forward fixed-rate positions. Using LCM, however, MG was required to book their current losses without recognizing the gains on their fixed-rate forward positions until they were realized. Since German accounting standards did not allow for the netting of positions, MG's income statement was a disaster. As such, their credit rating came under scrutiny and the financial community speculated on the demise of MG. This drastically changed the market arena for MGRM. Their swap counterparties required additional capital to maintain their swap positions and the NYMEX imposed supermargin requirements on MGRM more than doubling their performance bond requirement. If hedge accounting had been acceptable in Germany, MGRM's positions may not have alarmed the marketplace and they might have been able to reduce their positions in the OTC market without getting their eyeballs pulled out.

### **Observations: Just Another Lucky Trader?**

Benson rejoined MG in 1991 after enjoying the huge success of his backwardation strategy in the jet fuel market. He found himself in a

market with prices going against him. The timeliness of the Gulf War bailed him out to the tune of a reported \$500 million. He was again a hero and his services were in demand.[5] Benson's career can hardly be describe stellar. Even his track record with MG was shaky at best. His contemporaries are quoted off the record as referring to him as a "cowboy without cattle". However, it was clear that he was re-hired to market the fixed rate agreements. It is unclear, due to the lack of documentation, if Benson actually had the monetary commitment from MG to maintain these large hedge positions. The Supervisory Board claims that it had never assured that the funds would be made available.

Benson maintains that he had devised a put strategy that would have relieved some of the pressure on the hedge position. The put strategy theoretically would have been a profitable one if the futures price would have kept decreasing in price. Why did he wait until December of 1993 to introduce this strategy? He could have easily put these positions on several months earlier.

### **Who's To Blame?**

Although German accounting standards and the contango market both contributed to MG's problems, we stress that the true problem with MGRM was the size of their position. The average trading volume in the heating oil and unleaded gasoline pits usually averages anywhere from 15,000 to 30,000 contracts per day. With MGRM reportedly holding a 55,000 contract position in these contracts, the exchange community was well aware of who was long. The exchange market simply could not handle an effective hedge with a position so large and out of character. It created a funding risk for MGRM that proved enormous. Arthur Benson is widely blamed for this predicament and he does bear a large amount of responsibility for MG's situation. He strongly believed in normal backwardation in the oil market and thought he had found a way to cash in on it. His blame notwithstanding, the Management Board and Supervisory Board should not be held blameless. The Supervisory Board has pleaded ignorance in the massive buildup of MGRM's forward and hedge positions. If they truly were ignorant, they weren't doing their job. If they knew of the positions and didn't understand them, they weren't doing their job. If they knew of the positions and understood them, they had confidence in Benson's strategy and took a calculated risk. If this is the case, Benson has become a scapegoat for MG. Wherever the truth lies, MG's Supervisory Board shares the blame for this situation.

### **Concluding Remarks:**

Clearly, the management of MG would have benefitted from implementing the recommendations put forth in the Group of Thirty Derivatives study. These recommendations are basic, but the blatant disregard for these principles cost MG a mere \$1.5 billion.

While a financial crisis of MG's magnitude is rare, the nature of their

losses is becoming more frequent in the financial marketplace. Are derivatives the cause of these unexpected losses that seem to commonly blindside companies? Every few weeks we hear about a new company that lost money either speculating in the derivatives market or lacking an understanding of a hedge position they entered into. As the derivatives markets continue to grow, we will continue to hear of losses.

MG's disaster in the oil markets should be seen as a reminder to the corporate community to understand the nature of their position in financial markets and to understand the ramifications of market movements on your financial positions. It should not be seen as a warning sign to corporate CFO's to stay away from derivatives markets. These markets provide tremendous value to their users. The swaps and futures markets provided MGRM with an opportunity to transfer their market risk. They successfully did this. They failed, however, to accurately estimate the funding risk of their hedge position. By following the recommendations of the G30 Derivatives study, MG's near financial ruin could have been avoided.

*Mr. John Digenan, Mr. Dan Felson, Mr. Robert Kelly and Ms. Ann Wiemert are Students of The Financial Markets and Trading Program, Stuart School of Business, Illinois Institute of Technology.*

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### **Endnotes**

[1] Culp, Christopher and Miller, Merton, "Risk Management Lessons from Metallgesellschaft", Journal of Applied Corporate Finance, 1994.

[2] *Ibid.*

[3] Edwards, Franklin R. Systemic Risk In OTC Derivatives Markets:

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[4] Culler and Miller, *op. cit.*

**Acknowledgements:**

The team appreciates the following individuals for their time, resources and personal views:

Mr. Jack Reerink, a free lance reporter for Futures Magazine, author of "Inside the MG Trading Debacle", April 1994.

Mr. Christopher Culp, an independent financial risk consultant, an adjunct policy analyst with the Competitive Enterprise Institute in Washington, D.C., and a doctoral candidate in finance at The University of Chicago, Graduate School of Business.

Mr. Bill Falloon, reporter for RISK magazine.

Ms. Jane Hampson and S. Waite Rawls III, IIT Stuart School of Busines.

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