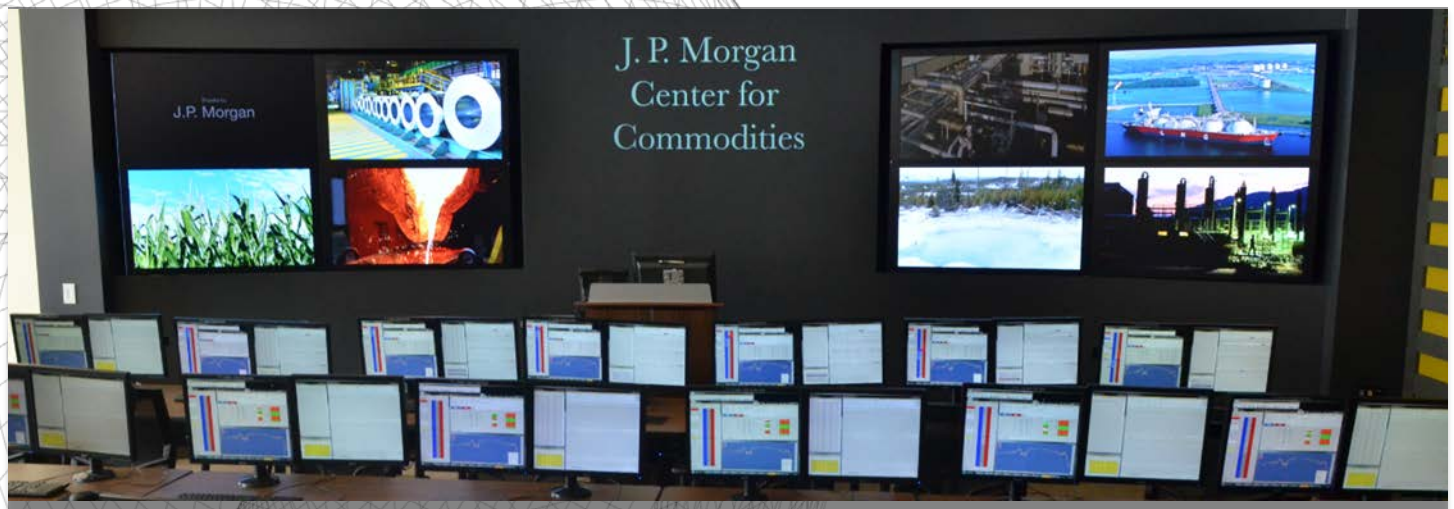


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# Commodity Trading Strategies, Common Mistakes, and Famous Debacles

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# Outline of Presentation

I. Commodity Trading Strategies

II. Common Mistakes

III. Famous Debacles

*Source of Image: "From Field to Market," a painting by Gary Kelley, located in the CoBank Lecture Hall at the University of Colorado Denver Business School.*

The opinions expressed during this presentation are the personal opinions of Hilary Till and do not necessarily reflect those of other organizations with which Ms. Till is affiliated.

*Based on Till et al. (2018).*

# I. Commodity Trading Strategies

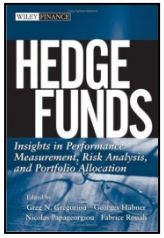
A. Trend-Following

B. Calendar-Spread Trading

C. Payoff Profile

# A. Trend-Following

***Trend-Following is the Predominant Style Amongst CTAs***




"Although there are two basic types of CTA's, discretionary and trend-following, the investment category is dominated by trend-followers.

Trend-followers are also known as systematic traders. The operative word here is systematic.

Automated programs screen the markets using various technical factors to determine the beginning or end of a trend across different timeframes."

*Source: Till and Eagleeye (2005).*

# A. Trend-Following

## *Hypothetical Performance from January 1903 to June 2012 Across Asset Classes and Timeframes*

**Hypothetical Performance of Time Series Momentum**

**Strategy performance after simulated transaction costs both gross and net of hypothetical 2-and-20 fees.**

| Time Period | Gross of Fee Returns (Annualized) | Net of 2/20 Fee Returns (Annualized) | Realized Volatility (Annualized) | Sharpe Ratio, Net of Fees | Correlation to S&P 500 Returns | Correlation to US 10-year Bond Returns |
|---|---|---|---|---|---|---|
| **Full Sample:** | | | | | | |
| Jan 1903 - June 2012 | 20.0% | 14.3% | 9.9% | 1.00 | -0.05 | -0.05 |
| **By Decade:** | | | | | | |
| Jan 1903 - Dec 1912 | 18.8% | 13.4% | 10.1% | 0.84 | -0.30 | -0.59 |
| Jan 1913 - Dec 1922 | 17.1% | 11.9% | 10.4% | 0.70 | -0.12 | -0.11 |
| Jan 1923 - Dec 1932 | 17.1% | 11.9% | 9.7% | 0.92 | -0.07 | 0.10 |
| Jan 1933 - Dec 1942 | 9.7% | 6.0% | 9.2% | 0.66 | 0.00 | 0.55 |
| Jan 1943 - Dec 1952 | 19.4% | 13.7% | 11.7% | 1.08 | 0.21 | 0.22 |
| Jan 1953 - Dec 1962 | 24.8% | 18.4% | 10.0% | 1.51 | 0.21 | -0.18 |
| Jan 1963 - Dec 1972 | 26.9% | 19.6% | 9.2% | 1.42 | -0.14 | -0.35 |
| Jan 1973 - Dec 1982 | 40.3% | 30.3% | 9.2% | 1.89 | -0.19 | -0.40 |
| Jan 1983 - Dec 1992 | 17.8% | 12.5% | 9.4% | 0.53 | 0.15 | 0.13 |
| Jan 1993 - Dec 2002 | 19.3% | 13.6% | 8.4% | 1.04 | -0.21 | 0.32 |
| Jan 2003 - June 2012 | 11.4% | 7.5% | 9.7% | 0.61 | -0.22 | 0.20 |

*Source: Hurst et al. (2012), Exhibit 1.*

# B. Calendar-Spread Trading

Proprietary futures traders often specialize in understanding the factors that impact the spread between two (or more) of a commodity futures contract's delivery months.

These traders engage in *calendar-spread trading.*

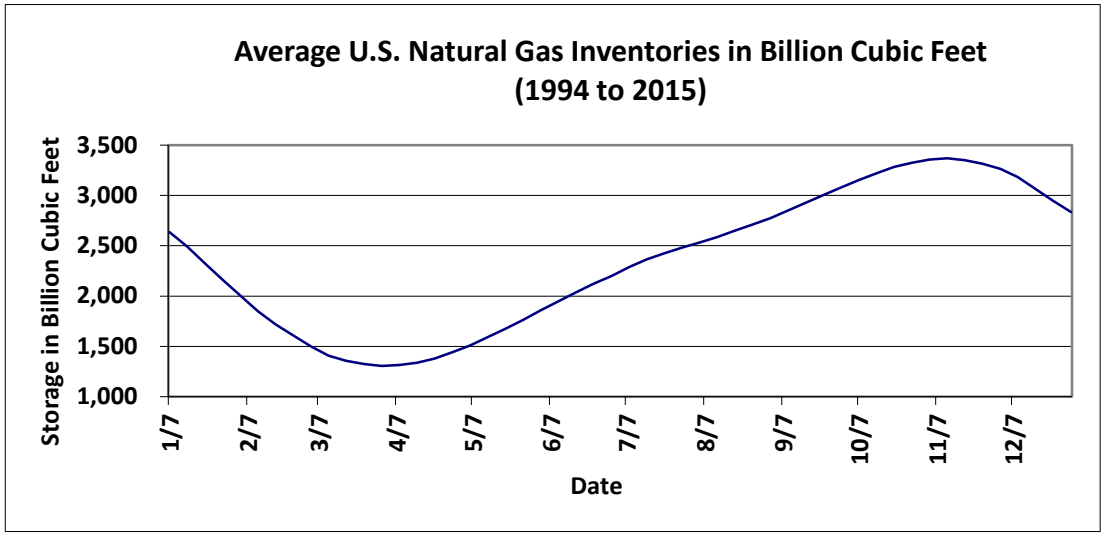
Calendar spread opportunities arise when a seemingly predictable one-sided commercial or institutional interest exists in particular futures contract(s): a proprietary trader will thereby take the other side of this "flow."

Examples of one-sided flow have occurred (a) during seasonal inventory build-and-draw cycles and (b) during the scheduled times when futures contracts are rolled in commodity indices.

# B. Calendar-Spread Trading

## 1. Trading Strategies Keyed to Seasonal Inventory Build-and-Draw Cycles

To the extent that commercial hedging activity causes trends in calendar spreads, a speculator can potentially have a profitable edge in taking the other side of these trades.




*Sources of data: The Bloomberg and U.S. Energy Information Administration.*

# B. Calendar-Spread Trading

## 2. Trading Strategies Keyed to Commodity Index Rolls

Commodity index rules specify when a particular index constituent should be sold and a further-maturity contract should be bought.

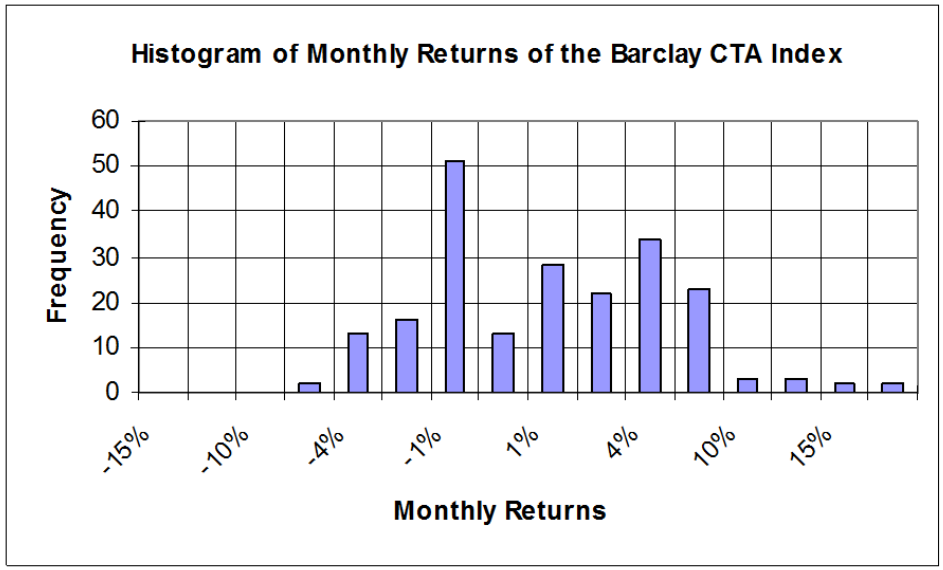
In advance of such a procedure, speculators in some commodity futures contracts have historically sold the front-month while buying the next-month contract, establishing what is known as a *bear-calendar spread*.

They would then unwind this position during index roll dates.

# C. Payoff Profile

In examining the level of fees that funds are able to charge for moving the return distribution of an asset class to the right, one might conclude that investors highly prize positive skewness.

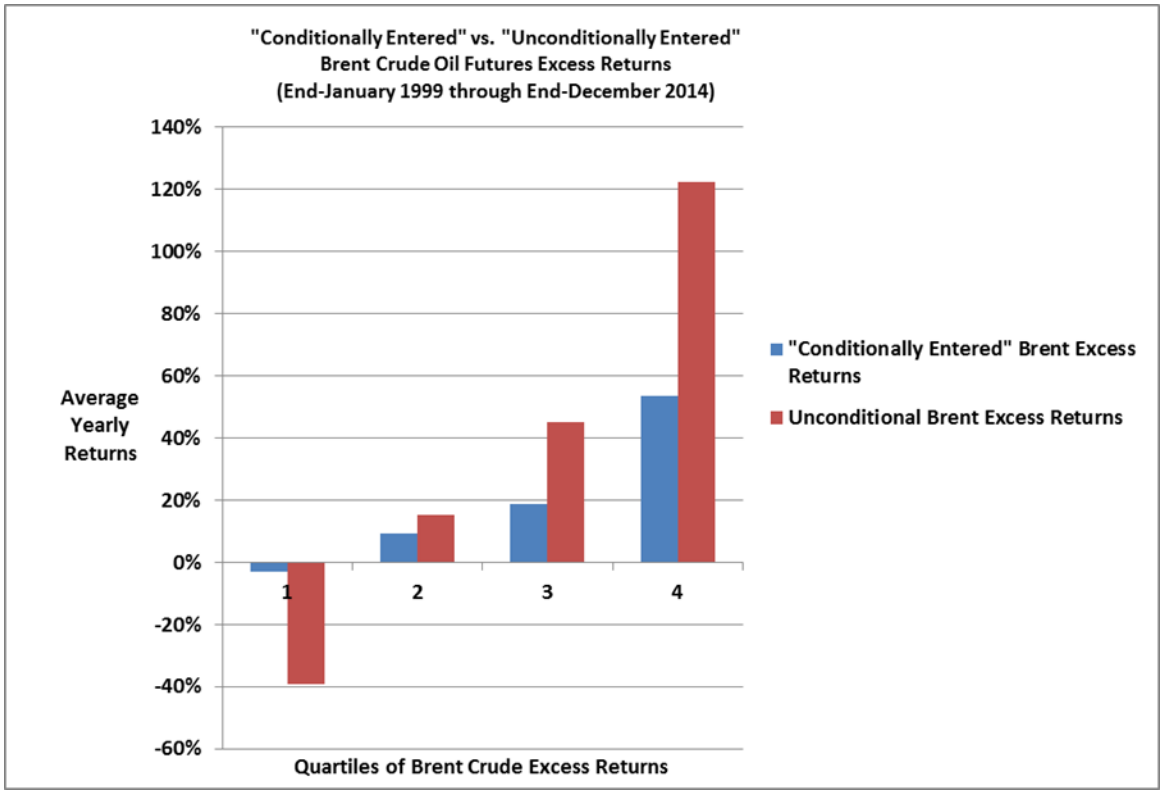
Therefore, it is useful to examine a strategy's potential option-like characteristics.




*Source : Lungarella (2002).*

# C. Payoff Profile

An example crude oil futures trading strategy that has a collar-like profile:




*This strategy is incorporated in the Premia Bancor:*
*http://www.customindices.spindices.com/custom-index-calculations/premia/all*

*Source of graphic: Till (2015).*

# II. Common Mistakes

A. Targeting Returns Rather than Risk

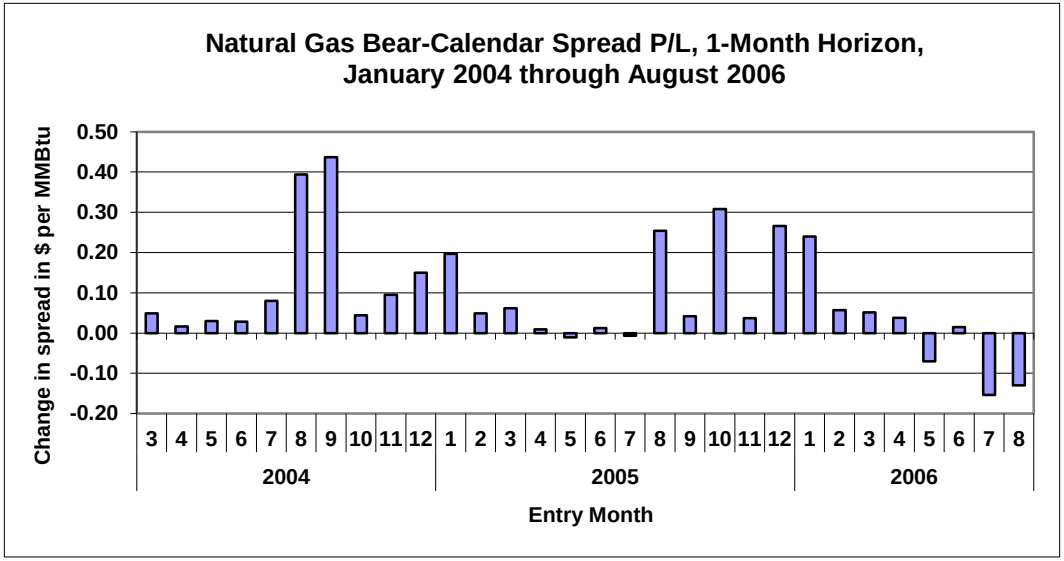
B. Inappropriate Trade Sizing

C. Inadequate Appreciation for Psychological Discipline


*This section is also covered in the Spring 2017 Global Commodities Applied Research Digest, which is available at: http://www.jpmcc-gcard.com.*

# A. Targeting Returns Rather Than Risk

Eagleeye (2007): "One can manage risk … [but] one can't demand a threshold return from the market." If one does otherwise, there can be disastrous consequences.




This strategy had been consistent between Spring 2004 and Spring 2006.

# A. Targeting Returns Rather Than Risk

By early summer 2006, the profitability of this strategy had declined by about half of the performance of the previous two years.

If commodity futures traders had responded by doubling up their position size to try to maintain an absolute-return target, then in July and August of 2006, they would have sustained losses about twice the size of the trader's year-to-date profits.

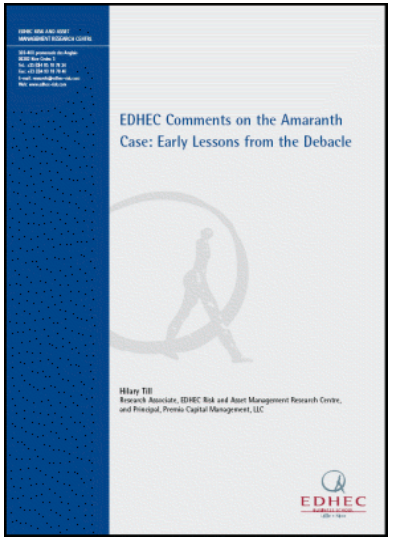
# B. Inappropriate Trade Sizing

***"Nodal Liquidity"***

The commodity markets do not have natural two-sided flow.

The commodity markets have "nodal liquidity."

Therefore, one must keep trade sizing within a relatively small fraction of daily trading volume.

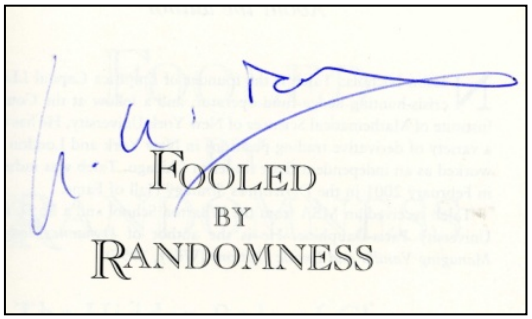



This objective is apparently difficult for traders to live by when prior success brings a massive influx of capital.

*Source: Till (2006).*

# C. Inadequate Appreciation for Psychological Discipline

***Question: Why Is It Challenging to Follow a Disciplined Investment Process?***




Taleb (2001) explains why it is a challenge for a manager to follow a disciplined investment process.

Taleb provides an example of a return-generating process that has annual returns in excess of T-bills of 15% with an annualized volatility of 10%.

At first glance, one would think it should be trivial to carry out a trading strategy with such superior risk and return characteristics.

*Source: Based on Till (2004).*

# C. Inadequate Appreciation for Psychological Discipline

***Answer: Because It Can Be Exhausting***

But Taleb also notes that with such a return-generating process, there would only be a 54% chance of making money on any given day.

**Probability of Profit at Different Time Scales**

| Scale | Probability |
|---|---|
| 1 year | 93% |
| 1 quarter | 77% |
| 1 month | 67% |
| 1 day | 54% |
| 1 hour | 51.30% |
| 1 minute | 50.17% |
| 1 second | 50.02% |

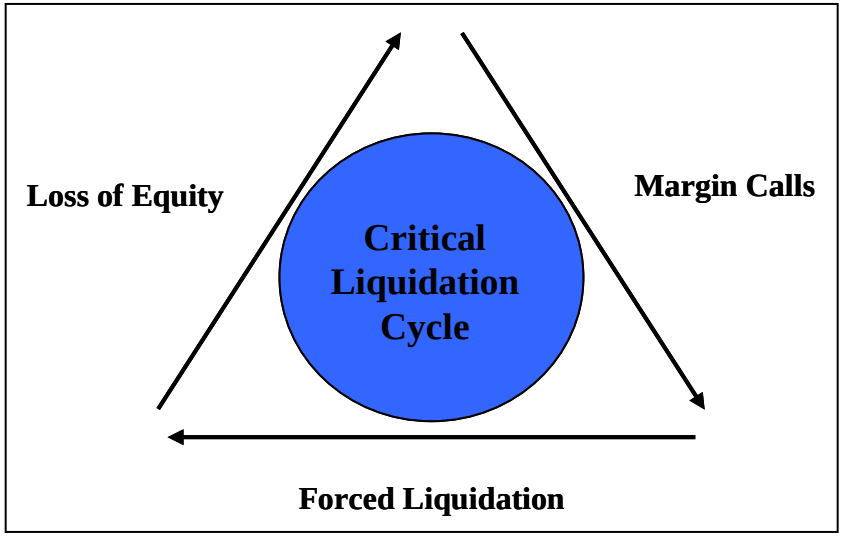
*Source: Taleb (2001).*

If the investor felt the pain of loss say 2.5 times more acutely than the joy of a gain, then it could be potentially exhausting to carry out this superior investment strategy.

# III. Famous Debacles

A. Amaranth

B. MF Global




*Source of graphic: De Souza and Smirnov (2004).*

# A. Amaranth

1. Background
2. Trading Strategies
3. Risk Analysis
4. Operational Risks
5. Legal Conclusions

*Source: Updated from Till (2008b).*

# 1. Background

As of 8/31/06, Amaranth Advisors had about $9.2 billion in assets under management.

On Monday, September 18th, 2006, the founder had issued a letter to investors, informing them that the fund had lost an estimated 50% of their assets since its end-August value.

The fund had lost -$560 million on Thursday, 9/14/06 alone.

By the end of September 2006, these losses amounted to over $6 billion.

# 2. Trading Strategies

Amaranth's core energy trading strategies were constructed through calendar spreads, which were executed on both the New York Mercantile Exchange (NYMEX) and the Intercontinental Exchange (ICE).

Amaranth's spread trading strategy involved taking long positions in winter contract deliveries and short positions in non-winter contract deliveries. (See Chincarini (2007).)

 These positions would have benefited from potential weather events such as hurricanes and cold-shocks from 2006 through 2011.

# 3. Risk Analysis

## *Scenario Analysis*

**Scenario Analysis if Winter vs. Non-Winter Spreads Reverted to Past Spread Relationships**

| Number of Contracts | Spread Symbol | Natural Gas Spread | 8/31/06 Level |
|---|---|---|---|
| (105,620) | NGV-X | October-November | -2.18 |
| 59,543 | NGH-J | March-April | 2.14 |

| Date | NGV-X | NGH-J | Losses due to V-X | Losses due to H-J | Total Losses | Portfolio Loss |
|---|---|---|---|---|---|---|
| 8/31/2000 | -0.058 | 0.26 | $ (2,241,256,400) | $ (1,119,408,400) | $ (3,360,664,800) | *-36.5%* |
| 8/31/2001 | -0.33 | 0.09 | $ (1,953,970,000) | $ (1,220,631,500) | $ (3,174,601,500) | *-34.5%* |
| 8/31/2002 | -0.33 | 0.113 | $ (1,953,970,000) | $ (1,206,936,610) | $ (3,160,906,610) | *-34.4%* |
| 8/31/2003 | -0.25 | 0.44 | $ (2,038,466,000) | $ (1,012,231,000) | $ (3,050,697,000) | *-33.2%* |
| 8/30/2004 | -0.643 | 0.57 | $ (1,623,379,400) | $ (934,825,100) | $ (2,558,204,500) | *-27.8%* |
| 8/31/2005 | -0.185 | 2.24 | $ (2,107,119,000) | $ 59,543,000 | $ (2,047,576,000) | *-22.3%* |

One caveat with this analysis is that it is based solely on the positions that were documented in the 6/25/07 U.S. Senate report on the debacle.

This analysis may therefore be incomplete, to the extent that Amaranth held other sizeable positions *not* documented in the Senate report.

*See Till (2008a) for further caveats and explanations regarding this analysis.*

# 4. Operational Risks

## *Fauchier Partners' Due Diligence*


*Source: Hosking (2006).*

# 5. Legal Conclusions

Zapac (2013): "[I]n August 2009, … [Amaranth] agreed to pay $7.5 million to end U.S. cases brought by FERC [the Federal Energy Regulatory Commission] and the CFTC [Commodity Futures Trading Commission] over price manipulation."

Van Voris and Hurtado (2014): On September 15, 2014, the former head natural gas trader at Amaranth "agreed to pay $750,000 to settle a Commodity Futures Trading Commission lawsuit claiming he tried to rig prices of natural gas contracts …"

# B. MF Global

1. Background
2. Warning Signs
3. Final Week
4. The Response of Regulators and Bankruptcy Trustees
5. Shortfall in Customer Segregated Funds
6. CFTC Charges and Settlement

*Source: Updated from Till (2012).*

# 1. Background

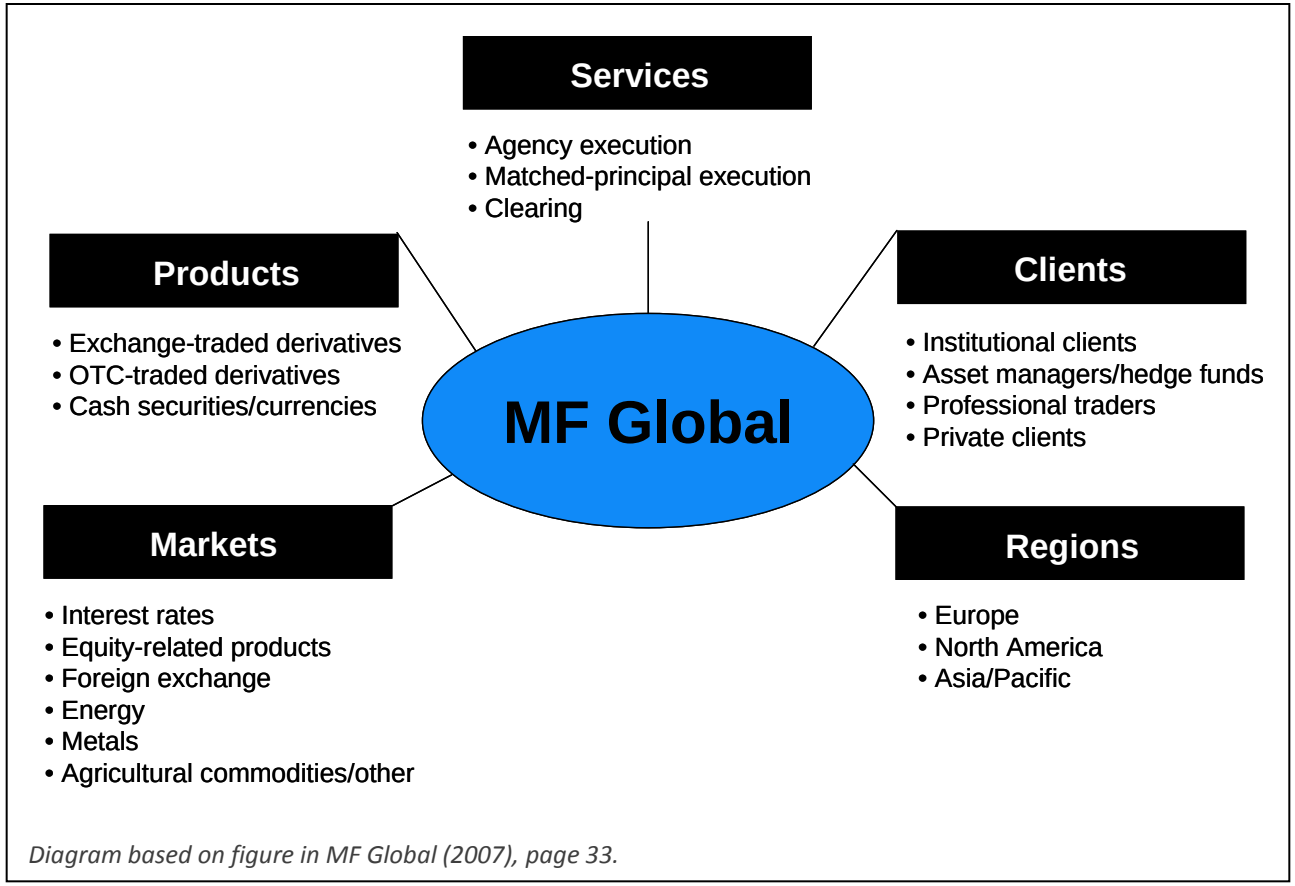



*Diagram based on figure in MF Global (2007), page 33.*

# 2. Warning Signs

Prior to the firm's spin-out from its parent company in 2007, MF Global's business could be characterized as "dull normal."

During the spin-out of MF Global (MFG), parent company Man Group burdened MF Global with (arguably) an enormous short-term debt load, relative to the firm's profitability.

We can see how large this debt load was from one of the company's financial statements that is available on the SEC website, EDGAR.

**Excerpted from MF Global Ltd. Form 10-Q as of December 31, 2007:**

**MF GLOBAL LTD.**
**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**
**(Unaudited)**
**(Dollars in thousands, except share data)**

Short-term borrowings consist of the following:

| | December 31, 2007 | March 31, 2007 |
|---|---|---|
| 364-Day Bridge Facility | $ 1,400,000 | $ - |
| Other short-term borrowings | $ 400,000 | |
| Bank overdrafts | 73,672 | 25,453 |
| Current portion of long-term borrowings | | 56,552 |
| Total | $ 1,873,672 | $ 82,005 |

# 2. Warning Signs

## *Net Excess Regulatory Capital*

**MF Global Inc. (Formerly Man Financial Inc.)**

| A/O Date | Adjusted Net Capital | Net Capital Requirement | Excess Net Capital | Customers' Required Segregated Funds* | Excess Net Capital / Customer Funds | |
|---|---|---|---|---|---|---|
| **05/31/2007** | $ 581,103,464 | $ 402,913,253 | **$ 178,190,211** | $ 8,384,461,426 | 2.1% | |
| **06/30/2007** | $ 605,217,511 | $ 364,381,766 | **$ 240,835,745** | $ 8,235,595,803 | 2.9% | |
| . | | | | | | |
| . | | | | | | |
| . | | | | | | |
| **10/31/2007** | $ 535,142,778 | $ 427,261,012 | **$ 107,881,766** | $ 9,929,407,496 | 1.1% | |
| **11/30/2007** | $ 645,473,966 | $ 414,600,708 | **$ 230,873,258** | $ 9,889,773,129 | 2.3% | |
| . | | | | | | |
| . | | | | | | |
| . | | | | | | |
| **02/29/2008** | $ 640,913,963 | $ 509,842,535 | **$ 131,071,428** | **$ 13,007,347,859** | 1.0% | <-- 6th Lowest Ratio Amongst 151 FCMs |
| **03/31/2008** | $ 771,268,907 | $ 417,502,089 | **$ 353,766,818** | $ 9,684,866,771 | 3.7% | <-- 26% Drop in Customer Segregated Funds |
| . | | | | | | |
| . | | | | | | |
| . | | | | | | |
| **05/31/2008** | $ 782,299,749 | $ 443,840,666 | **$ 338,459,083** | $ 9,664,731,983 | 3.5% | |
| **06/30/2008** | $ 608,963,888 | $ 456,329,713 | **$ 152,634,175** | $ 10,566,911,049 | 1.4% | <-- On 6/13/08, company announces** plan to refinance $1.4 billion bridge loan. This includes using "excess funds." |
| . | | | | | | |
| . | | | | | | |
| . | | | | | | |
| **08/31/2011** | $ 495,665,616 | $ 328,485,943 | **$ 167,179,673** | $ 7,270,301,248 | 2.3% | |

*Data Source: The Commodity Futures Trading Commission (CFTC) monthly reports on "Financial Data for FCMs," which are accessible at: http://www.cftc.gov/MarketReports/financialfcmdata/index.htm.*

* *These figures only include funds "required" to cover margins. As of February 2012, the CFTC now also releases the total assets in customer accounts, according to Prezioso (2012).*

** *Source: MF Global (2008).*

# 2. Warning Signs

MF Global's business model became in jeopardy during the compression of yields available in fixed-income investments.

| | YEAR ENDED MARCH 31, | | | | |
|---|---|---|---|---|---|
| (Dollars in millions) | 2011 | 2010 | 2009 | 2008 | 2007 |
| **Net (loss)/ income attributable to MF Global Holdings Ltd.** | $ (81.20) | $ (137.00) | $ (49.10) | $ (69.50) | $ 188.00 |

*Source: MF Global (2011), p.36.*

As a futures commission merchant (FCM), the firm had strongly relied on income from the investment of customer collateral for its profitability.

A FCM is allowed to credit back to customers only a fraction of the income the FCM earns on customer collateral.

# 2. Warning Signs

The plan of the MF Global CEO was to eventually convert the futures broker into an investment bank.

The CEO devised a strategy to enter into a large-scale, leveraged, proprietary trade on five "peripheral" European bond markets in an apparent bid to assure the firm's profitability in the face of a challenging environment for its business model.

| Company | Stated Balance Sheet Exposure* | Exposure as a % of Q End Equity | Exposure as a % of Q End Assets | Quarterly VaR Average | VaR as a % of Q End Equity |
|---|---|---|---|---|---|
| MF Global (MF) | $6.4 B | 460.6% | 13.9% | $3.0 M | 0.2% |
| Citigroup (C) | $13.5 B | 7.7% | 0.7% | $184 M | 0.1% |
| Goldman Sachs (GS) | $1.9 B | 2.6% | 0.2% | $101 M | 0.1% |
| Jefferies (JEF) | N/A | N/A | N/A | $12.7 M | 0.4% |
| JP Morgan (JPM) | $14 B | 7.7% | 0.6% | $94 M | 0.1% |
| Morgan Stanley (MS) | $2.0 B | 3.4% | 0.2% | $145 M | 0.2% |

*as measured under a firm's internal approach

*Source: Hughes Hubbard & Reed LLP, Attorneys for James W. Giddens, Trustee for the SIPA Liquidation of MF Global Inc. (2012b), p. 89.*

# 3. The Final Week

At the end of October 2011, in rapid succession, the firm experienced a credit downgrade and announced worst-than-expected earnings, leading investors, clients, and creditors to doubt the sustainability of the firm's business model.

At that point, MF Global rapidly liquidated some of its European bond bet; attempted to meet additional margin calls that resulted from its ratings downgrade; and attempted to meet customer redemptions as clients left the firm *en masse*.

# 3. The Final Week

By the early morning of October 31, 2011, regulators were losing confidence in the firm when it was unable to reconcile its books and satisfactorily explain a significant shortfall that had been discovered in the firm's customer segregated accounts.

This "shortfall was without precedent in the history of the futures industry," according to a U.S. House of Representatives memorandum of March 2012.

A potential deal for another firm to buy MF Global collapsed, given the shortfall in customer segregated accounts.

*Source: United States House of Representatives (2012).*

# 4. The Response of Regulators and Bankruptcy Trustees

On October 31, MF Global's holding company declared bankruptcy under Chapter 11 of the Bankruptcy Code; and the Broker-Dealer/Futures Commission Merchant subsidiary was put into liquidation in a Securities Investors Protection Act (SIPA) proceeding.

The legal procedures, though, which cover the liquidation of securities firms, can potentially be interpreted such that they conflict with the legal procedures that were designed for the bankruptcy of futures firms.

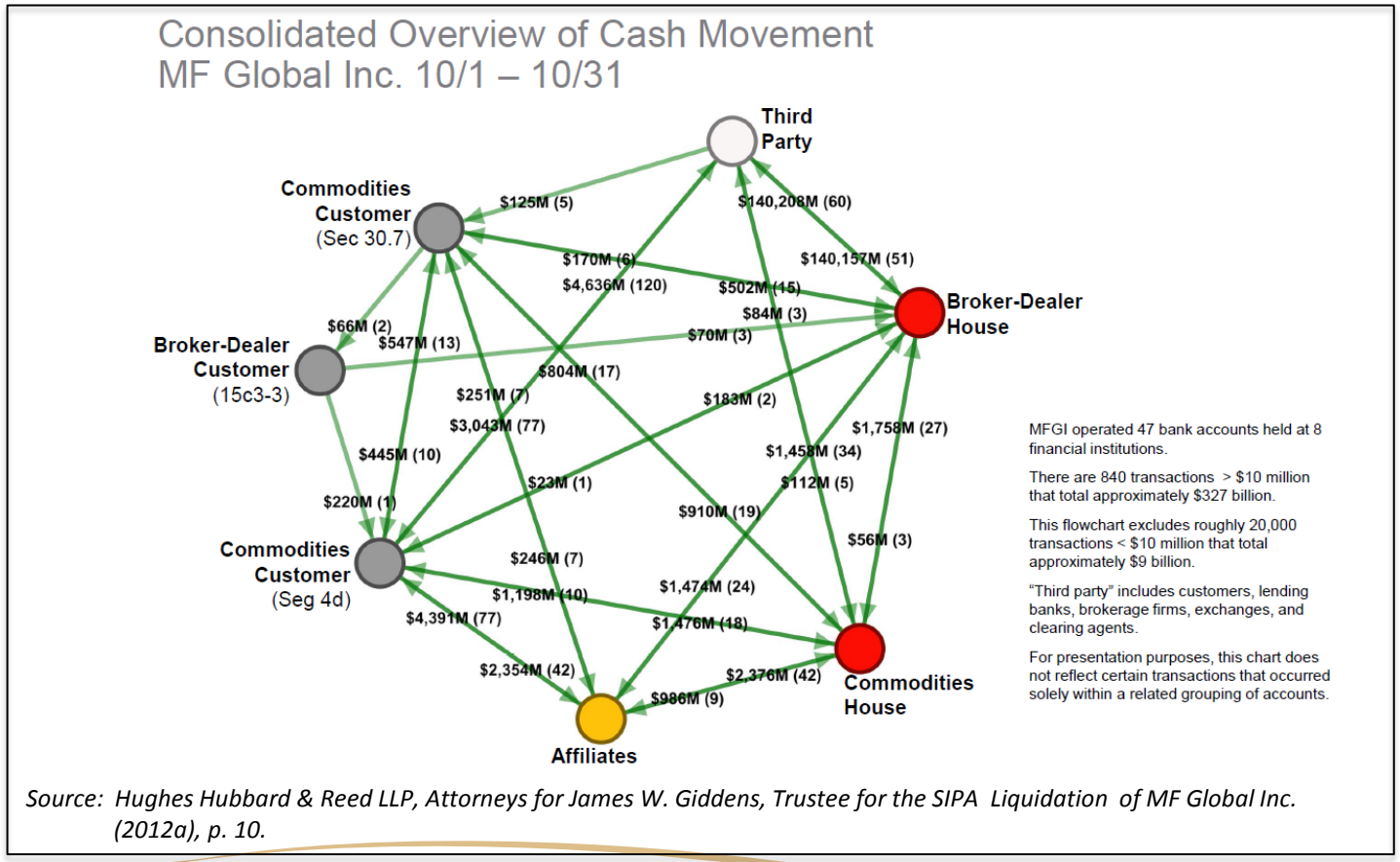
That said, there is a credible body of law that futures customers should have priority over all other claimants.

The SIPC [Securities Investor Protection Corporation] trustee responsible for liquidating MF Global Inc. had to go through a "steep learning curve regarding futures operations."

*Sources: Corcoran (1993), Melin (2012), and Collins (2012).*

# 5. Shortfall in Customer Segregated Funds

In summary, the firm just did not have enough capital for its various lines of business.




*Source: Hughes Hubbard & Reed LLP, Attorneys for James W. Giddens, Trustee for the SIPA Liquidation of MF Global Inc. (2012a), p. 10.*

# 6. CFTC Charges and Settlement

On June 27th, 2013, the CFTC charged that:
"MF Global [had] unlawfully used nearly one billion dollars of customer segregated funds to support its own proprietary operations and the operations of its affiliates …. [Former MF Global CEO Jon] Corzine bears responsibility for MF Global's unlawful acts. He held and exercised direct or indirect control over MF Global and Holdings and either did not act in good faith or knowingly induced these violations."

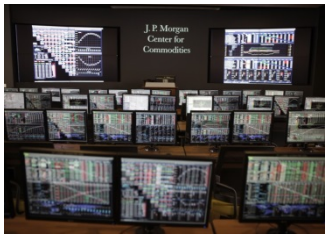
On January 4th, 2017, Corzine settled with the CFTC and paid $5 million to settle claims from the case. The regulator also set a lifetime ban on him personally trading other people's money in the futures industry.

*Sources: CFTC (2013) and Till et al. (2018).*

# Conclusion

Gaining expertise in the commodity markets usually occurs through trial-and-error experiences.

The main goal of this presentation is to provide enough cautionary notes and lessons to potentially help others avoid similar debacles!



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