Commodities: Strategic Hedging
B8415
Spring 2015, A Term
Monday, Wednesday 9:00am – 10:30am

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Course Description:
Commodities are a large and important component of the global economy. The focus of this class is why commodity-producing companies may want to strategically hedge their commodity price exposures in the futures and options markets. Commodity producers generally want to hedge so they can free up their capital and put it to more interesting uses like expanding their companies.

We will spend considerable time exploring a model for the optimal hedging behavior of commodity producing companies. In particular, after reading the relevant research paper that describes a model of the economics of strategic hedging, we will re-derive the model and its implications, add a second commodity exposure to the model to expand its usefulness, and implement multiple versions of it in excel.

One exciting aspect of the class is that we’ll get access to a few industry experts. Last year, we heard from Bob Greer, an Executive Vice President and Real Return Product Manager of PIMCO; Chris Calger, Managing Director, JPMorgan Global Commodities; Dave Rusate, Managing Director, Global Business Services, General Electric, responsible for commodities risk management; Sal Gilbertie, President, Chief Investment Officer and co-founder of Teucrium, a commodity ETF firm; and Eliott Geller, CBS alum at CoreCommodity Management.

We will briefly cover physical commodities and how the futures markets work, including forward curves, margins, and trading exposures. We will also cover strategic investments in commodities by institutional investors, which turn out to be directly related to producer hedging. Through a paper-based futures trading contest, you will gain first-hand experience with the futures markets.

In practical terms, for this class you will need to build a reasonably complex spreadsheet. I’ll do all of the derivations for the model and extensions of it. You will need to be able to interpret the economic significance of the resulting relationships and apply them to practical problems. You will also need to be able to apply the model to problems and calculate the producers’ optimal hedge ratios.

Potential Benefits from the Class:
- Increased knowledge of the commodities futures markets
- Deep understanding of why commodity producers and consumers hedge their commodity exposure and insights into what increases and decreases the optimal amount of their hedge
- Networking opportunities with industry experts
- Experience with model building and modification
Key Caveats

- This course is about strategic hedging, not tactical trading. Other than via the paper portfolio contest, we will not be arguing about why gold or oil or corn prices are going to go up, down, or sideways. We can talk structurally about what might influence demand and supply of a particular commodity, just without the emphasis on a short-run price prediction.
- A large portion of the grade is based on class participation. You have only six weeks to make a positive impression on me in class. In order to do that you must be in class, on time and prepared. You must contribute to the discussion in a professional and constructive way. It is not possible to make a high pass grade without making a positive impression during class discussions.
- The backbone of the class is a quantitative model of the impact of hedging on a commodity producer’s or consumer’s earnings and balance sheet. Over several iterations of lectures about it and homework and a project using it, you’ll need to become comfortable using it and develop some intuition about the characteristics of a company and the commodities markets that impact a firm’s hedging decisions.

Co-requisites
Capital Markets.
You will also find it useful to have a working understanding of futures contracts, although we will cover them briefly.

Reading materials
The hedging model we will cover comes from a research paper, “Creating Shareholder Value: Turning Risk Management into a Competitive Advantage,” that Steve Strongin and I wrote when we were both at Goldman, Sachs & Co. We’ll extend the model to add a second commodity price exposure.

We will cover three other of our Goldman research papers:
- “The Strategic Case for Commodities”
- “What is the GSCI?”
- “The Long-Run Returns from Passive Capital”

We will also cover chapters from:
- Commodity Derivatives: Markets and Applications by Schofield
- Options, Futures, and other Derivatives by Hull
Course Grading Scheme:
Groups of 2-3. Choose in week 1 and remain in same group for the rest of class.

30% Class participation
  • It is not possible to make a high pass grade without making a positive impression during class discussions.
40% Problem sets to be completed as a group
  • Three applications of the hedging model
30% Project to be completed as a group
  • Advocate for a hedging program at a commodity producer
  • Due during A term finals week

Late problem sets or projects will get zero credit.

Project
Each group will prepare a written project report between 5 and 15 pages long in a reasonable format in a word document. Choose a commodity producing company and assume it is your job to advocate for a new hedging program for them. You must convince the CEO that the firm should implement your hedging program. Convince me.
  • What exactly should they hedge?
  • How much?
  • How?
  • Why?
  • What is the benefit to them?
  • What are the risks?
  • What else might a CEO need to know before agreeing to your proposal?

Class Participation/Conduct Policies
Each of you should come to class prepared to contribute to the discussion. I expect you to behave professionally and respect everyone’s views. Each of you should contribute to the conversation without trying to dominate it. No computers or phones may be used during class. Assignments will be due by 8:45am on the relevant day unless otherwise specified. No late work will be accepted.

Trading Contest
Each group (the same group you choose for your homework and projects) will start with a paper portfolio of $5 million. Each week, you will submit a set of futures trades in an Excel template by 8:45am on Wednesday morning, starting Wednesday, February 4 and ending Wednesday, March 4. The group with the highest return on their portfolio of futures as of March 4 will win the contest. There will be a small prize in addition to the bragging rights. One missed deadline will result in a continuation of the prior week’s positions; more than one missed deadline will result in disqualification for the contest.
Course Outline:
Some topics will extend over more than one class session. Over the six weeks, I expect us to hear from two or three guest lecturers. They generally have challenging schedules, so our timeline for lessons will adjust to accommodate them. Potential guest lecturers include:

- Bob Greer, Executive Vice President, Real Return Product Manager at PIMCO
- Chris Calger, Managing Directors in the JPMorgan Global Commodities Group
- Dave Rusate, Managing Director, Global Business Services, General Electric, responsible for commodities risk management
- Sal Gilbertie, President, Chief Investment Officer and co-founder of Teucrium
- Eliott Geller, CBS alum at CoreCommodity Management

Session 1: Introduction, Futures Trading Contest, Futures
A) Class overview and introduction
B) Futures & forward markets
   a. Futures & forward contracts
   b. Futures exchanges & over-the-counter markets
C) Futures and forward curves
   a. Backwardation and contango
   b. Roll rules
D) Futures trading contest

Reading: Hull, chapters 1, 2, 3, and 5 and Creating Shareholder Value

Session 2: Introduction to the Hedging Model
A) The Hedging Model
   a. An introduction to the one-commodity model
   b. Assignment of first homework

Reading: Creating Shareholder Value

Session 3: Guest Lecturer

Session 4: Further Exploration of the Hedging Model
A) Review of first homework
B) Sensitivities of the one-commodity hedging model
C) Producers vs. consumers

Session 5: Expand the Hedging Model to Two Commodities
A) Start to expand the model to hedging two commodities
   a) Derivation
B) Assignment of second homework

Session 6: Exploration of the Two-Commodity Hedging Model
A) Implications and sensitivities of the two-commodity model
B) Examples from past projects
Session 7: Guest Lecturer

A) Assignment of third homework

Session 8: More Implementation of the Two-Commodity Hedging Model
A) Review the second homework
B) More examples of implementation and implications

Session 9: Framing Commodities as Part of an Institutional Portfolio
A) Goldman Sachs Commodity Index (GSCI)
B) Portfolio diversification
C) Interaction with the economic environment
D) Relationship to producer hedging

*Reading: The Strategic Case for Commodities,*
*What is the GSCI?*,
*The Long-Run Returns from Passive Capital*

Session 10: Guest Lecturer

Session 11: Specific Physical Commodities
A) Specific commodities
   a) Crude oil, crack spreads
   b) Industrial metals
   c) Grains and softs

*Reading: Schofield, chapters 4, 5, 6, 11, and 12*

Session 12: Review and Project Preparation
A) Review third homework
B) Review the class
C) Discussion of project preparation
D) Announcement of futures trading contest winners