Current topics and lists of associated RIT Cases

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1. Sell-Side Roles and Managing Liquidity and Market Risk

a) Agency Trading

i. Agency Trading 1 - VWAP Strategies

The first agency trading case is designed to introduce traders to order-driven markets, to order types and to VWAP strategies. For example, one can illustrate how using limit orders instead of market orders allows the trader to capture the bid ask spread instead of paying the bid ask spread. The market is designed to be extremely liquid so students will not be exposed to liquidity risk.

ii. Agency Trading 2 - Price Impact

The second agency trading case builds on the AT1 case by adding liquidity risk. In this simulation, the market will be extremely illiquid so students should use limit orders to execute their trades at desirable prices (that is, avoid price impact). Students will also be under a time constraint, and will potentially need to use some market orders in order to receive order fills in a timely manner.

b) Liability Trading

i. Liability Trading 1 - Trading as a Principal

The first liability trading case introduces students to taking on price and liquidity risk by accepting a large block trade and requiring them to unwind the position in the open market. While closing the position, they will cause price impact due to limited (but reasonably high) liquidity in the market.

ii. Liability Trading 2 - Orders in Illiquid Markets

The second liability trading case is considerably more difficult because it forces students to trade directly with each other in order to unwind their positions. A time constraint is also added, requiring that the trades be closed out by the middle and end of the trading session.

iii. Liability Trading 3 - Dynamic Order Arrival

The third liability trading case is a dynamic version of the LT2 case; students will receive their orders for different stocks at unknown intervals.

iv. Liability Trading 4 - Liability Trading Capstone

The fourth liability trading case adds multiple marketplace functionality and requires students to seek best execution while weighing different commission and passive order rebate schedules.

c) Arbitrage

i. Price Discovery 3 - Arbitrage Pricing

The third price discovery case builds on the previous cases by adding a second company and an ETF. The ETF can be priced on an arbitrage-free basis using the
market values of the two individual companies. Students should observe how the riskiness and distribution for the ETF is considerably different from the individually-priced companies.

ii. Liability Trading 4 - Liability Trading Capstone

The fourth liability trading case adds multiple marketplace functionality and requires students to seek best execution while weighing different commission and passive order rebate schedules.

iii. Algorithmic Trading 1- Algorithmic Arbitrage

The first algorithmic trading case introduces students to algorithmic trading by providing a simple example of exploiting an arbitrage opportunity for one stock traded on two different exchanges.

d) Market-Making

i. Liability Trading 4 - Liability Trading Capstone

The fourth liability trading case adds multiple marketplace functionality and requires students to seek best execution while weighing different commission and passive order rebate schedules.

ii. Algorithmic Trading 2 - Algorithmic Market Making

The second algorithmic trading case is considerably more difficult because it forces students to build on skills learned in the Algorithmic Arbitrage (ALGO1) case and motivate students to build a market-making algorithm that generates profits by capturing the bid-ask spread.

e) Smart-Order Routing

i. Liability Trading 4 - Liability Trading Capstone

The fourth liability trading case adds multiple marketplace functionality and requires students to seek best execution while weighing different commission and passive order rebate schedules.

2. Price Discovery and Law of One Price

a) Price discovery in equity markets with asymmetric information

i. Price Discovery 0 - Price Discovery

The Price Discovery 0 case demonstrates the concept of informational efficiency as students attempt to determine the fair price for a takeover bid. Students have asymmetric information which is updated over time but there is no aggregate uncertainty.

ii. Price Discovery 1 - IPO Pricing
The Price Discovery 1 builds on the Price Discovery 0 (PD0) case to demonstrate the concept of informational efficiency as students attempt to determine the fair price for a newly issued stock. As it happens in PD0, students have asymmetric information which is updated over time but there is no aggregate uncertainty.

iii. Price Discovery 2 - Asymmetric Information

The second price discovery case also demonstrates informational efficiency by giving students private price estimates and confidence intervals associated with those forecasts. The fair value of the equity is based on the intersection of all students' information.

b) Law of one price and arbitrage

   i. Price Discovery 3 - Arbitrage Pricing

   The third price discovery case builds on the previous cases by adding a second company and an ETF. The ETF can be priced on an arbitrage-free basis using the market values of the two individual companies. Students should observe how the riskiness and distribution for the ETF is considerably different from the individually-priced companies.

3. Fixed Income

   a) Fixed Income security pricing, characteristics of bonds, interest rate risk

      i. Fixed Income 1 - Treasury Bills

      The first fixed income case illustrates how to calculate the fair value (present value of future cash flows) of a risk-free treasury bill when interest rates are known. Trading is based on identifying a mispriced treasury bill.

      ii. Fixed Income 2 - Coupon Bonds

      The second Fixed Income case introduces a yield curve and government coupon bonds (nominally risk free). Students trading the bond learn about coupon payments, accrued interest, dirty and clean prices.

      iii. Fixed Income 3 - Interest Rate Risk

      The third fixed income case builds on the previous fixed income cases by adding interest rate risk.

   b) Overview of credit analysis, default risk

      i. Fixed Income 4 - Default Risk

      The fourth fixed income case presents students with risky corporate bonds with a chance to default and requires them to price the bonds accordingly. An arbitrage condition exists where students can build a portfolio of bonds with known default risk.
c) Yield measures and the term structure of Interest rates

i. Fixed Income 5 - Yield Curve

The fifth fixed income case challenges students' understanding of bond pricing based on news and benchmark interest rates derived from 4 non-tradable government zero-coupon bonds. Students have to price 3 tradable government coupon bonds based on the benchmark rates and news. The news, which will be released throughout the case, may have an impact on the benchmark rates, and thus on the fair prices of the tradable coupon bonds.

4. Equity Valuation

a) Price discovery, asymmetric information, relative valuation, structured products, M&A:

i. Price Discovery 0 - Price Discovery

The Price Discovery 0 case demonstrates the concept of informational efficiency as students attempt to determine the fair price for a takeover bid. Students have asymmetric information which is updated over time but there is no aggregate uncertainty.

ii. Price Discovery 1 - IPO Pricing

The Price Discovery 1 builds on the Price Discovery 0 (PD0) case to demonstrate the concept of informational efficiency as students attempt to determine the fair price for a newly issued stock. As it happens in PD0, students have asymmetric information which is updated over time but there is no aggregate uncertainty.

iii. Price Discovery 2 - Asymmetric Information

The second price discovery case also demonstrates informational efficiency by giving students private price estimates and confidence intervals associated with those forecasts. The fair value of the equity is based on the intersection of all students’ information.

iv. Price Discovery 3 - Arbitrage Pricing

The third price discovery case builds on the previous cases by adding a second company and an ETF. The ETF can be priced on an arbitrage-free basis using the market values of the two individual companies. Students should observe how the riskiness and distribution for the ETF is considerably different from the individually-priced companies.

v. Equity Valuation 1 - Relative PE Valuation

The first equity valuation case introduces students to basic equity valuation by applying a fixed P/E ratio to the realized earnings of a company to determine the associated stock valuation. Trading is based on identifying mispriced stocks according to that relative valuation criterion.
vi. Equity Valuation 2 - DDM Valuation

The second equity valuation case requires students to use the Gordon Dividend Discount Model to value the equity traded in the case. Students must model annual EPS, dividends, and the appropriate discount rate in order to derive a valuation for the company.

vii. Merger & Acquisitions 1 - Takeover Arbitrage

The first mergers & acquisitions case requires students to calculate the arbitrage-free price of a company that has received a takeover offer. The probability of the deal succeeding is dynamically updated through time and students must value the security based on the probability weighted outcomes.

5. Derivative Pricing

a) Futures and Forward Contracts/Prices

Structure of Futures markets
How Futures/Forwards prices are determined
Margin requirements
The cost-of-carry
Arbitrage
News trading

i. Futures 1 - Equity Index Futures

The first futures case is designed to introduce students to financial futures that track an index. Students can take long or short positions based on their view on whether the market as a whole is going to rise or fall in response to news releases.

ii. Futures 2 - Cost-of-Carry (Contango)

The second futures case facilitates learning about how futures contracts are priced based on the cost-of-carry. The case uses the contango relationship between physical crude and crude futures and provides arbitrage opportunities when the spread is sufficiently wide.

iii. Commodities 1 - Crude Oil Futures

The first commodities case allows students to profit from trading crude oil futures based on their assessment of the price impact of news releases. This is standard directional trading (in a futures market) based on relevant news that might affect the underlying.

iv. Commodities 2 - NG Futures
The second commodities case expands on the previous commodities case by providing students with a quantitative model that they can use to estimate the price shocks caused by forecasted supply and demand differentials for Natural Gas (NG). Students trade NG futures to profit from their price forecasts for the underlying NG.

v. Foreign Exchange Trading 1 - Covered Interest Rate Parity

The first FX case introduces students to the covered interest rate parity. They will have to find arbitrage opportunities by observing the relationship between interest rates and the spot and forward currency values of two countries.

b) Options

Structure of option markets and options payoffs
Properties of stock and index options
Strategies involving options

i. Options 1 - Puts and Calls

The first options case introduces students to call and put options. They can practice understanding payoffs and identifying mispriced options.

ii. Options 2 - Options Strategies

The second options case introduces students to Options Strategies and requires them to build long and short straddles, strangles, condors and butterflies.

iii. Options 3 - Trading Volatility

The third options strategies case introduces students to using options strategies to speculate on the volatility of the underlying. Students should seek out mispriced options (using put-call parity) and evaluate the volatility smile to determine which options positions can be used to exploit differentials between the implied and realized volatilities.

6. Portfolio Management

a) Diversification, portfolio choice for long-horizon objectives, Monte Carlo

i. Portfolio Management 1 - Diversification

The Portfolio Management 1 case requires students to allocate a sum of wealth across a diversified portfolio of ETFs. Students can use a Monte-Carlo analysis spreadsheet to evaluate the distributions, returns, and risks associated with different portfolios and then allocate theirs accordingly.

ii. Portfolio Management 2 - Rebalancing

The second portfolio management case is similar to the PM1 case, except it allows students to rebalance their portfolio intermittently. These rebalancing points
present students with the opportunity to enhance (or destroy) value by making wise risk and reward based decisions.

b) Portfolio choice subject to regulatory capital adequacy requirement

i. Value-at-Risk

The case will challenge students in managing their VaR exposure while allocating their funds to three different ETFs. Exceeding the VaR limit described in the case brief will result in fines that will reduce their overall portfolio performance. An Excel file is provided to instructors and can be used to compute and graph the fines, portfolio returns, and total returns for each participant.

7. Risk Management

a) Hedging using Futures

i. Hedging 1 - Hedging with Futures

The first hedging case requires students to use an index future to hedge their position in a basket of equities. The case introduces the students to the concept of hedging tracking error, portfolio beta, and hedging costs.

b) Hedging using Options (Portfolio Insurance)

i. Hedging 2 - Portfolio Insurance

The second hedging case allows students to use various put or call options across multiple months to hedge their position in a single stock. The students use this portfolio insurance strategy to protect their underlying equity position from downside risk.

c) Delta-Neutral Hedging

i. Hedging 3 - Delta-Neutral Hedging

Hedging 3 requires the students to act as a financial institution who is buying/selling blocks of options for individual equities from their clients. When trades are made, students are then responsible for hedging their position and remaining relatively 'delta neutral'.

d) Introducing production and price risk, crop hedging

i. Agricultural Hedging 1 - Price and Production Risk

The agricultural hedging case allows students to manage risks associated with a farmer's wheat production. Students must forecast yields (production level) and use domestic or international wheat futures contracts to hedge their price risk. While international contracts are more liquid than domestic, they come at the cost of being undeliverable in kind. Students must decide whether they wish to use a hedge that
tracks well due to liquidity but is cash-settled or a perfectly correlated domestic hedge at a higher cost, and evaluate their performance.

e) VaR based on regulatory capital adequacy requirement

   i. Value-at-Risk

   The case will challenge students in managing their VaR exposure while allocating their funds to three different ETFs. Exceeding the VaR limit described in the case brief will result in fines that will reduce their overall portfolio performance. An Excel file is provided to instructors and can be used to compute and graph the fines, portfolio returns, and total returns for each participant.

8. Commodities

   a) Crude Oil Futures

      i. Commodities 1 - Crude Oil Futures

      The first commodities case allows students to profit from trading crude oil futures based on their assessment of the price impact of news releases. This is standard directional trading (in a futures market) based on relevant news that might affect the underlying.

   b) Natural Gas Futures

      i. Commodities 2 - NG Futures

      The second commodities case expands on the previous commodities case by providing students with a quantitative model that they can use to estimate the price shocks caused by forecasted supply and demand differentials for Natural Gas (NG). Students trade NG futures to profit from their price forecasts for the underlying NG.

   c) Commodities Capstone Case

      News trading

      Cost-of-carry (storage, transaction costs)

      Location arbitrage

      Refinery arbitrage

      i. Commodities 5 - Commodity Capstone

      The fifth commodities case requires students to ‘juggle’ a magnitude of arbitrage and asset pricing strategies to generate profits. Students can take positions based on fundamental views of crude oil, or they can engage in locational, product, or storage arbitrage.