



Hedging 1

You've just left the monthly senior strategy team meeting at the State Pension and it's been decided by the upper management team that they wish to neutralize their equity exposure in the industrials sector for the next month.

As a member of the hedging overlay team, your responsibility will be to construct and apply a hedge of firm's investments.

The portfolio managers have sent you a summary of their relevant equity holdings. They currently hold 100 Million dollars worth of industrial stocks, in the following ten companies:

Ticker	Last Price Per Share	Shares Held	Total Value Held
GD	\$50.00	176,000	\$8,800,000
POP	\$80.00	156,250	\$12,500,000
RMS	\$25.00	580,000	\$14,500,000
BBL	\$16.00	281,250	\$4,500,000
TC	\$84.00	100,000	\$8,400,000
GEB	\$52.00	200,000	\$10,400,000
PKR	\$154.00	100,000	\$15,400,000
TTW	\$62.00	200,000	\$12,400,000
NWL	\$8.00	1,112,500	\$8,900,000
GGS	\$21.00	200,000	\$4,200,000
Total		3,106,000	\$100,000,000

A spreadsheet with the historical price performance for the 10 companies is available at this website: <http://rit.rotman.utoronto.ca/cases.asp>

The investment committee has informed you that they would like the hedge to be as cost effective and liquid as possible, so they want you to use index futures on the market index (RTX) to hedge your exposure. They understand the tradeoff is that they will lose hedging accuracy in return for a cheaper and quicker hedge.

Kevin Mak* and Tom McCurdy** prepared this case for the RIT market simulation platform, <http://rit.rotman.utoronto.ca/>.

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Just before getting into the elevator, the CIO mentioned: “Throughout the month you may adjust or rebalance your hedge, but I really doubt it is necessary– it’s the summer and the betas of all the stocks should be fairly constant.”

Hedging Simulation #1 – H1

All students will begin the H1 trading simulation with \$100,000,000 million invested across the ten companies. Students cannot trade the individual stocks, but they can purchase or short sell index futures (RTF). Students should construct a hedge using the index futures to minimize their portfolio variance for the 1 month (5 minutes of trading).

The market index (RTX) is calculated based on 100 of the largest companies across all industries. The cash index value is currently 1050, and there is a one month futures contract (RTF) available to be traded with a contract multiplier of 250. The index pays no dividends and the risk free rate is zero. The futures contract is marked-to-market daily, and is cash settled at month end. The minimum tick increment for the futures contract is 0.10 (1/10th of one index point).

Discussion Questions and Follow Up:

- (1) What is the beta of your portfolio?
- (2) What is the correct number of futures to use (and direction, long vs short) to hedge your equity portfolio?
- (3) What is the transaction cost of implementing the hedge, based on the bid-ask spread of the futures (assuming zero trading commissions)? Assuming all stocks had a bid-ask spread of 1 cent and no liquidity risk, what would the cost be to sell all of your shares and then buy them back at the end of the month?
- (4) If one were hedging a portfolio with more index holdings (say 80 companies), would the accuracy of using the index futures to hedge the equity portfolio increase or decrease?