

# A Virtual Trading Project for the Derivative Securities Course

Stephen C. Henry

*In this paper, I present a simulated trading project for the undergraduate Derivative Securities course which allows students to realistically trade both Futures and Option contracts. The project makes use of the Virtual Trading tool provided on the Chicago Board Options Exchange website, which processes virtual trades in real time using actual market data.*

*Student response to the project's first implementation in Fall 2008 has been overwhelmingly positive. I provide Likert-style survey results describing students' perceptions of various aspects of the assignment, and identify directions for potential future modifications.*

## INTRODUCTION

Numerous studies exist which support the notion that experience plays an important role in the learning process. Consequently, experiential learning activities have become an important part of the curriculum for courses of all types. "Bridging the gap" between theory and practice is important in all business disciplines, and is especially critical for investment-related Finance courses. Each year, business schools and their faculty members spend a great deal of time and money in an effort to deliver "real-world" experiences and activities for such courses; stock tickers, market simulations, trading rooms, and the like. However, developing activities of this sort for courses in derivative securities has been a challenge, at least when working within a limited budget. While several fee-based online services offer simulated trading of stocks (Stock-Trak for example), none seem to offer adequate handling of option trades. Most option courses provide at least some coverage of complex order types (spreads, straddles, etc.), which are not accommodated in most stock-oriented simulations. Furthermore, in order to be effective, a simulation should take into account both the interplay of stock and option prices, and the varying liquidity of different contracts. Essentially, this means that actual option trading data must be used as the basis of the simulation. Fortunately, the Chicago Board Options Exchange provides a trading simulation that incorporates these features.

## THE CBOE VIRTUAL TRADING FACILITY

The CBOE virtual trading facility<sup>1</sup>, available at no cost to users, has a number of features which make it a valuable resource for derivative securities courses. First, it allows for seamless trading of both futures and options within the same account. Second, it automatically handles the more mundane bookkeeping aspects of such a project, recording trades,

deducting commissions, and providing periodic status reports, and an end-of-semester summary of the results. Also, complex order types such as spreads and straddles are easily entered and unwound. Most importantly, perhaps, the results of simulated trades are based on actual CBOE trading activity.

Trading of derivative securities based on real-world data gives students a much better grasp of the subtleties of the marketplace than fictional examples can provide. For instance, as option expiration dates approach, students are likely to witness the implied volatility collapse on option positions held for too long. Also, since the simulation only executes virtual trades when compatible actual trades occur, students may encounter problems unwinding some positions. As a result, they are forced to be mindful of the liquidity of the contracts they choose. An awareness of such market imperfections is one of the key insights delivered by this real-data simulation.

## THE TRADING PROJECT

In teaching a course in futures and options markets, I have developed a class assignment which makes use of the features of the CBOE virtual trading tool. In order to offer students as much flexibility as possible in choosing their strategies, the requirements specified for the assignment are fairly limited. Students were to begin with an initial endowment of \$100,000 in their virtual trading accounts, and were required to allocate at least \$75,000 to option trades (the rest could be in stocks, futures, or simply held as cash; option trading is emphasized in this assignment)<sup>2</sup>.

In order to discourage "all or nothing" speculative trades, I required students to allocate their option trades across at least four different underlying assets, and to take at least one *bearish* and one *bullish* position. In this way, students were encouraged to do a bit of company research in order to choose the best strategies. Any assets with CBOE-traded options were fair game, including equities, indexes, and interest rates. Most students, however, limited their trades to individual stock options. Students were encouraged (with bonus points) to develop complex orders such as spreads and straddles, and many chose to do so.

At the end of the semester, class members were required to hand in an accounting of all of their trades, an analysis of the outcomes (including transaction costs), and a report of their overall gains or losses on a weekly basis. The CBOE system makes this easy, and by having students utilize the standard reports, I have some external assurance that trades were actually entered when reported. It's important to make students aware that they **MUST** track the progress of their trades during the project; unlike stocks, historical option prices are not

readily available, thus it is impossible for them to go back after the fact and construct trades they “would have made” in previous weeks. A copy of the assignment page I distributed to students is included in the appendix as an example.

### SURVEY OF STUDENT PERCEPTIONS

At the conclusion of the Fall 2008 semester, I administered a brief survey to students in order to gauge their perception of the value of this assignment in the context of the rest of the course. Results of the survey are presented in Table 1. Although inference is questionable with such a small sample size, *t*-statistics and associated probabilities are reported for a two-tailed test of the hypothesis that the mean of responses is equal to three (the “neutral” response to each question). In general terms, the results suggest that: (1) Students found the futures trading project (which did not utilize the CBOE system) more difficult than the options trading project. (Admittedly, it is not necessarily the case that use of the virtual trading system is the reason for the difference in perceived difficulty). (2) Students perceived the trading project to be valuable in gaining an understanding of the mechanics of these marketplaces. And (3), the CBOE system was a valuable resource in completing the assignment.

### CONCLUSION

Although the survey responses are interesting, the informal feedback I received from students regarding this project was far more gratifying. Class members were much more engaged with the class material during the project, and many apparently found the project to be quite enjoyable. Having taught the course for several years prior to using the virtual trading system, I had continually struggled to keep the students engaged and connected to the real-world mechanics of option marketplaces. The CBOE Virtual Trading system has been of immense benefit, and will remain an important tool for me in future courses.

1. <http://www.cboe.com/tradtool/virtualtrade.aspx>

2. When I originally developed this assignment, the CBOE virtual trading system was set up to accommodate trading in futures contracts, and a part of the assignment was dedicated to futures trading. However, I found the futures portion of the system to be unreliable, often failing to execute valid trades. Consequently, I did not endorse the use of the CBOE site for the futures trading portion of the project. Hopefully, future improvements to the system will make it usable for the futures component of the course.

*Statistical results of the student survey and a copy of the trading assignment are available on the website ([www.jfcr.org/jitf](http://www.jfcr.org/jitf)).*

*Stephen C. Henry is an Assistant Professor of Finance at the State University of New York at Plattsburgh.*

## Using Mortgage Rates to Explain Risk Premiums in an Introductory Finance Course

*Kenneth P. Moon and Glenn Tanner*

*Devising an effective way to teach interest rate determinants and help students understand various risk premiums is an essential part of any introductory finance course. Unfortunately, because these topics are commonly taught in conjunction with the introduction of bonds, students often become confused while trying to simultaneously learn new terminology and concepts related to bond pricing. In this paper, we describe a more student friendly approach to teaching interest rate determinants. We believe students gain a better understanding of risk premiums when related to loan types they are already somewhat familiar with. Specifically, this paper describes how to use a simple comparison of various mortgage rates to more clearly explain concepts such as default risk, interest rate risk, and liquidity risk. This approach focuses students' attention on the concepts at hand rather than confusing them with multiple high level applications at one time.*

### INTRODUCTION

Introducing interest rate determinants in an introductory finance course is one of the most crucial lessons of the semester. Understanding the risk premiums built into required returns is vital for comprehending asset pricing, which is perhaps the most important topic in finance. Generally, instructors introduce interest rate determinants using bond yields. We advocate the use of mortgage loan rates for several reasons:

1. Introductory finance students are generally unfamiliar with bonds, which are a confusing topic by themselves for many students. Students are much more likely to be familiar with traditional amortizing debt, such as car loans and student loans, which will ease the understanding of rate determinants.
2. Learning about the different mortgage types is more “real-world” useful for many students. Undergraduate business students tend to have a range of majors, many of which may not encounter bonds in their career, but most of which will look into mortgage loans later in their lives. Many graduate students may have already experienced shopping for a mortgage.
3. Finally, introducing the different types of mortgages will advance students’ understanding of some of the issues contributing to the current financial crisis. Specifically, students will become aware of the secondary mortgage market, Fannie Mae, and Freddie Mac.