**Using Trading Platforms for Simulated Trading in the Financial Derivatives Course**

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**Abstract**

*The use of computer simulation in business education has become so widespread that it now considered a standard educational tool. There are now many different business management simulations available targeting different aspects of business management at various levels of student preparation and background. Despite this, not all areas of instruction have available focused specialty simulations which provided real-world level of detail and complexity. Financial derivatives trading has until recently been one of these areas. However, the recent trend of financial services firms offering up their trading platforms in simulation format has significantly changed the situation. This paper discusses the development and discusses the use of one such trading platform based simulation in the senior level undergraduate financial derivatives course.*

**INTRODUCTION**

Using computer based simulations in the classroom has become common as the level of computer technology has advanced and the number of simulation software packages has increased. In teaching investment management the use of computer based simulated trading has become the norm – at least in capstone level courses.

Recently, many brokerage firms have begun to make access to their actual trading platforms available to prospective clients. As a recruitment tool, the individual is given access to the full capabilities of the firm’s trading platform and is allowed to trade “paper money”. While most such offers are available to individuals, a limited number of firms have recognized the potential benefits of offering group simulated trading to those in academic settings.

The key additional required attribute is the ability to create and manage groups of simulated traders for specific periods and with specific constraints as to types of securities traded, types of trades allowed, notional investment balances, and so forth. With the addition of these group creation and management features, the financial firm’s “trial run” trading program become a very realistic basis for formatted simulated trading exercises in an organized course setting.

However, not all financial firms understand the potential benefit from having their platforms used by prospective future professional clients while these prospects are still engaged in preparatory coursework. The author’s experience includes interactions with representatives of firms which jealously guarded access to their platform and those who didn’t understand the need for an educator to be able to coordinate and assess student trading.

Fortunately, a subset of these firms sees value in having a connection to education. These firms have been willing to add features which allow the effective use of their trading platforms for simulated trading within the setting of a formal college course.

This paper presents the difficulties encountered by the author while attempting to identify an appropriate trading platform to use for simulated trading in the financial derivatives course. The advantages and disadvantage of certain platforms are discussed. Examples of the design and management of multiple course module specific simulated trading “drills” is then presented. Suggestions are then made concerning how others might incorporate the technology into their own courses.

**Instructional Objective and Search for Trading Platform**

The author’s interest in derivatives trading simulation arose upon being reassigned to teach the senior level introductory financial derivatives course after a long absence. A simulation was sought which would allow students to engage in simulated trading in futures, options, and futures options on a wide variety of underlying assets. While some of the older stock market trading simulations offered futures or options trading, the range of underlying assets was quite limited. Thus the simulations widely used in simulated stock trading would not allow for the simulated trading of the wide range of derivatives and underlying asset combinations discussed in the course.

While searching for trading simulations, the author became aware of the CME’s Trading Challenge which pits teams from schools around the world against each other in simulated futures contract trading. CME’s technology partner for these simulated trading contests is CQG, a provider of financial market trading technology to institutional and higher level individual traders. The CQG platform is an extremely complex and well developed trading platform.

Unfortunately, CQG up until the time of this writing has jealously guarded access to the trading platform software. In recent CME Challenge simulated trading contests, CQG has essentially made the platform available to educators and student participants only around the time of the Challenge activities itself, with only a short period of learn and practice time prior to the Challenge. In addition CQG removes access to the trading platform shortly after the Challenge stages are completed.

Certainly CQG’s platform is quite advanced and one assumes that the firm has business condition analysis and revenue maximization clearly in mind in the maintenance of this policy. However, this policy makes CQG’s platform a very poor choice for the academic since ongoing use of the platform is not possible. In order to maintain a sharp and ready familiarity with the platform, the academic would need to use the platform herself or himself (at full cost) throughout the year in order to be prepared to help students quickly ramp up for the annual CME Challenge program.

Then, too, since the CQG platform is not available to students throughout the semester during which the CME Challenge is held, even students who participated in the CME Challenge would be forced to change trading platforms for the remainder of the course if simulated trading were used for the standard full length semester course.

The author’s failure to convince the CQG group of the need for extended access led to the search for an alternative real-world quality trading platform for use in the course. Typical online searches proved to be of little use at first, since available information tended to be focused on attracting new trading customers – not attracting academics to use the trading platforms for classroom purposes.

When contacted by phone, multiple providers affirmed that students could certainly open practice trading accounts. However, none of those initially contacted had any provision for group formation, coordination, and management.

Then, as chance would have it, the author encountered a fellow finance faculty member who recommended TD Ameritrade as it had an interest in coordinating with academic programs.

TD Ameritrade’s academic outreach programs arose out of an employee’s disappointing classroom experience with a traditional trading simulation. The employee, Mary Ryan, was completing a Finance degree and found herself using her company’s Think or Swim trading platform to overcome the disadvantage arising from the time delay in the quotes of the unnamed simulation.

Thereafter, TD Ameritrade begin to develop an academic outreach program built upon free academic access to the company’s Think or Swim trading platform include access to real-time quotes on a wide variety of securities, including futures, options, and futures options. From promotional materials and public presentations it seems clear that the company has adopted a model whereby its desire to train the next generation of investors while engendering product loyalty justifies granting free academic access and bearing the cost of supporting the related academic customer service. This stands in stark contrast to the example of the CQG group discussed earlier.

Before moving on to the implementation of a course model incorporating the Think or Swim platform, it is appropriate to note that at least one other provider, Trade Station, has begun to offer a similar program. However, the author does not have direct experience using that product in the classroom.

**Using Trading Platform Based Simulated Trading in the Financial Derivatives Course**

A quick review of the available textbooks for the undergraduate financial derivatives course will demonstrate two distinct approaches to introducing the various types of derivatives to the students. One approach begins with futures contracts and then progresses to options, while the other begins with options and then presents futures contracts.

The author prefers the approach which approaches options contracts as economically equivalent to futures contracts with the added feature of a “right to walk away”. Therefore, the author has chosen to use a textbook which presents futures contracts before options contracts. This basic course design then determines the way in which the simulated trading exercises are used in the course. At present the author is using the “Fundamentals” version of the widely used text by John Hull.

With the academic use coordinating account, the professor can establish any number of “Trading Drills” which focus on different derivative types or different trading approaches. Students can also be organized into trading groups or trade as individuals. The author chose a mixture of group and individual trading exercises for the course. In the recent course offering four separate trading session variations were used.

Because the trades and results for each trader were available to all, it was possible to discuss the various strategies and activity levels evidenced by different members of the class. This enabled multiple discussions about the wide variation in outcomes which can result from both hyper active and less active trading.

**Trading Drill One**

The first trading drill was an individual trading exercise intended to both familiarize the students with the trading platform and to attempt to use basic technical analysis techniques. This first session lasted one week with students divided into teams. During this trading exercise students were limited to trading only futures contracts.

As part of the course lectures ongoing during this period, basic presentation of candle stick chart patterns and rudimentary strategies were made. Students were encouraged to attempt to trade using strategies implied by the traditional interpretation of candlestick charts. During this period the students were quizzed on the basics of this charting approach.

Students were required to make a minimum number of trades. Although some students made only the minimum number of trades, others became enthusiastic traders engaging in a large number of trades. Because the trade history recorded the time of trades, it was clear that some students had become deeply involved in the experience with trades occurring very late at night and in the wee morning hours for those contracts which have near continuous trading.

Student outcomes from the first drill were quite widely distributed, ranging from a gain of 14.5% to a loss of 16.46% on a notional starting account balance of $100,000. Because the trading activities of the other groups were accessible, students were able to assess the relative success of active and inactive traders.

**Trading Drill Two**

The second trading drill of the semester was a group exercise emphasizing longer term “position trading”. In this simulated trading exercise students were formed into groups of three and asked to implement a trading strategy driven by the economic and political conditions in the market for a given commodity. Trading was again limited to futures contracts.

While the first trading drill allowed very short-term trading, the second trading drill required the student groups to disclose their trading hypothesis in advance and then hold a position for a minimum of four days. This trading drill lasted approximately two weeks.

After the drill had ended, each group made a presentation to the class explaining their analysis, trades, and results. Many of the groups waiting until nearly the last hour to attain the minimum holding period, so the objective of having a longer term trading window was somewhat muted. It would likely improve the benefit of this particular type of drill if the minimum holding period was increased. The performance on this trading drill ranged from a gain of 3.71% to a loss of 61.59% on a notional beginning account balance of $100,000

**Trading Drill Three**

The third trading drill was an individual student exercise in which only individual options could be traded. This simulated trading exercise lasted one week. Because the students had only been exposed to the basic option payoffs at this point, most student trades were based entirely on straightforward directional expectations.

The outcomes in this case ranged from a gain of 3.08% to a loss of 3.44% on a notional starting balance of $500,000. Some students failed to participate at all in this trading drill, which may have been due in part to the timing of the exercise.

**Trading Drill Four**

The fourth trading drill was limited to trades involving combinations and spreads. These are option trading strategies whose payoffs depend on the interaction of multiple short and long positions in related options contracts. This trading drill proved to be a bit intimidating to some students. Performance on this drill ranged from a gain of 9.26% to a loss of 88.3% on the starting notional balance of $1,000,000.

**Summary and Recommendations**

It should be noted that the simulation constraints are limited by the regulatory requirements associated with the real world trading conducted by the firm’s real world trading clients. This proved a complication when it became apparent that a particular trading drill designed to facilitate option trading strategies would need to be modified because options and futures options have a different regulator structure. Real world clients would not necessarily be qualified to trade both, so the TD Ameritrade support staff had to retroactively modify each student trader’s account to mimic the addition of real world trading authority for futures options. The instructor is urged to consider the practical regulatory based definitions instead of the theoretical ones.

In the semester reported upon in this paper, the use of the Think or Swim trading platform was delayed for several weeks into the semester. The tradeoff is between having a longer portion of the semester available for individual trading exercises and having the students wait until they have a more complete foundation in the valuation of the derivatives securities before trade begins. There is a distinct risk that beginning trading simulations before an adequate foundation is given may foster the “casino” perspective towards trading in some of the students.

Were the simulation exercises to have been started earlier in the semester, it would have been possible to add a fifth trading drill which went beyond expectations basis for options trades. This fifth trading drill would be conducted late in the semester after the students had been more fully exposed to option pricing models. Thus they could have explored more arcane trading strategies which depend upon the option “greeks” which describe option pricing dynamics.

Finally, this paper reports on an approach which utilizes multiple distinct trading exercises designed to focus on a particular type of trading and type of security individually as that topic is covered in the course. An alternative would be to run a single semester-long simulation with different emphasis at different points during the semester. The individual instructor should consider the merits of these two distinct approaches relative to his or her individual teaching style.