

The students also believed that changing the composition of the groups reduced the free-rider effect. Over 82% of the students agreed or strongly agreed with the statement that “having the group members change for the economic, market and sector analyses helped reduce the free-rider problem that frequently occurs in group/team projects.” Only 6% of the students agreed or strongly agreed that having the same group members for all levels of analysis would have been a better educational experience.

CONCLUSION

We use groups in our security analysis classes to enhance the educational value of the top-down approach. We successfully incorporated a number of techniques to manage the free-rider effect. Specifically, we randomly assign students to groups, change the composition of the group for each project, require each student to evaluate other group members, and have each student use the information provided by each group and individual student. These techniques could be implemented as is, or in conjunction with other techniques that manage the free-rider effect. Our experience with using groups in this environment was positive for us as instructors and for the students because our methodology: (1) reduced the student workload, (2) allowed for sharing information, information sources, and analysis, and (3) mitigated the free-rider problem. In the end, all students are required to work in order to gain knowledge to earn a high grade in the course!

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Learning About Market Microstructure and Price Discovery Using Experimental Markets

Stephanie Y. Rauterkus and Andreas H. Rauterkus

This study introduces the use of an instructor-developed trading simulation to teach intrinsic value estimation, price discovery, and market mechanics. It provides the reader with a cost efficient solution to deepen students' understanding of financial markets and the price discovery process. By using a multi-week time frame we allow students to analyze the financial information of the companies in the simulation as well as to develop strategies to exploit the market structure and price discovery process. Thus, this simulation combines the importance of financial analysis with the awareness of the impact of liquidity and market organization on price discovery.

THE ROLE OF DEEPER INFORMATION AND EXTERNALITIES IN CASE STUDIES

Students are often interested in learning how to make money in the stock market and hearing stories of how savvy investors have parlayed spare change into great fortune. Finance professors, however must balance that enthusiasm with a thorough treatment of the risk-return tradeoff, market

efficiency and other key financial concepts. Successful students are able to apply this financial theory to investment practice. Institutions of higher learning are having great success in bridging the gap between theory and practice through innovative programs. These programs include the adoption of the Chartered Financial Analyst curriculum, acquisition of state-of-the-art computing technology and data feeds such as Bloomberg, Compustat and Reuters and the

launching of student-managed investment funds. Many colleges and universities house all of these resources under one umbrella – a finance ‘lab’. Whether housed in a specific physical location or achieved virtually with the use of technology, students and faculty can use the lab to access historical market data and analyze current investment decisions or attempt to better understand market behavior. Also, faculty can use this environment to simulate a financial market in order to observe behavior for both research and teaching purposes. Most of these market simulations can be classified in two broad ways. First, instructor designed games are developed and managed independently by an instructor. These types of simulations allow the instructor total control over the design and execution of the simulation. The second type of market simulations are commercial simulations provided by third party vendors. These simulations are mostly Internet-based and allow the instructor limited design options within the framework of the program. In recent years, much work has been done to create classroom innovations that enhance student learning and improve learning outcomes. Therefore, the use of trading simulations has soared and is used to accomplish many and different objectives, such as introducing option pricing theory, simulating commodity trading and getting to know the students.

In an effort to help students to bridge the gap between finance theory and investment practice, we develop a virtual trading floor utilizing two separate trading platforms. The new approach of this methodology is that we create a purely fictitious market that does not incorporate actual stocks but companies that were developed just for this purpose and students may trade these securities over a number of weeks³. Thus, the students create their own market where trade execution and price determination is based solely on the actions of the participants. In times of tight budgets this approach allows instructors to create a simulation similar to commercial trading simulations without the monetary expense. This exercise allows instructors to highlight the differences between trading and investing. Traders exploit the limit order book structure and the price discovery process. This exercise gives students an appreciation for these skills by forcing them to develop a trading strategy. Investors need to analyze the financial information that is provided to them. By only allowing limit orders, we force students to come up with a reservation price for each security based on their own analysis.

We conduct the exercise over a series of trading ‘rounds’ where some trading rounds are required and others are optional. Trades are ‘cleared’ on the same day each week allowing students a few days between trading sessions where no activity occurs. This gives them the opportunity to address weaknesses in their analysis or trading strategy before placing additional trades. Our anecdotal evidence suggests that the exercise provides students with a better understanding of how markets work.

SIMULATION

To implement this exercise, the instructor will need to first distribute the case instructions to the students at least one

week prior to the start of the case. We recommend that at least thirty minutes of class time be reserved for reviewing these instructions and outlining what students will be required to do. The instructions include:

- An overview of the case;
- A list of required dates that the students must trade;
- Instructions on how to place trades;
- Data on the firms that will be traded;
- A sample account statement; and
- An explanation of how student performance will be evaluated.

A full set of case instructions is included in Appendix A (see www.jfcr.org/jitf.html). Students are given profiles and fundamental data for three firms (SML, MID and LRG). We use three generic firms rather than actual firm names to prevent students from making buy/sell decision based on information that was not specifically given to them by the instructor. In addition, earnings announcements and other news that would trigger a buy/sell decisions are not available often enough for "real" companies to allow the experiment to be run within a 2-3 week time span. Individually, students are given their allocation of shares of each stock and cash (see Appendix B for an allocation matrix that can be used to assign initial student allocations). While not all students receive the same allocation of stock, cash or some combination of the two, all portfolios are initially valued at \$1,000,000.

Constructing the Limit Order Book and Clearing Trades

During each of the five weeks of the exercise, students may submit trades at any time. However, trades are only ‘cleared’ three times each week. Trading takes place over 13 non-consecutive trading days with each trading day simulating one calendar month. There are 13 total trading periods. After the cutoff time for each trading period (4:30 PM on Mondays, Wednesdays and Fridays), we compile all orders and construct a limit order book. To do this, we enter each trade in our Limit Order Book template. We sort the buy and sell orders separately such that the best bid (highest buy price) and best ask (lowest sell price) are at the top of the respective lists of orders. We then act as ‘specialists’ and set a ‘market clearing price’ in order to execute trades in a manner that clears as many trades for each stock as possible. We use the following logic to set the market clearing price:

- If the best bid price is less than the best ask price, we set the market clearing price at the midpoint between the two prices. For example, if best bid = \$28 and best ask = \$30, the market clearing price is \$29 and consequently no trades will clear.
- If the best bid price is equal to the best ask price, we set the market clearing price equal to this price. For example, if best bid = \$29 and best ask = \$29, the market clearing price is \$29 and all buy orders priced at \$29 will clear provided there is enough quantity available to be sold at that price.
- If the best bid price is greater than the best ask price, we rely on the specialist’s charge of setting a price that would clear the most trades. Therefore, we review the prices and quantities of several of the best buy and sell orders in our limit order book. We consider all possible prices between

the best ask price and the best bid price and determine the quantity of shares that would be exchanged at each price level.

We then send order confirmations to each trader and update each trader’s brokerage statement (please see appendix C for an example of the brokerage statement). We use a set of Microsoft Excel templates to construct the limit order book for each trading period, brokerage statements for each participant and a summary of portfolio values across all participants by period. Copies of these templates are available from the authors upon request.

Earnings and News Announcements

‘News’ announcements are made each trading ‘month’ and ‘earnings’ announcements are made at the end of each trading ‘quarter’ (see a sample newsletter in appendix C). Students are required to place limit orders for all three firms prior to the first news announcement and after each earnings announcement. Students can purchase a news service which allows them to receive the newsletter and earnings information earlier than the other market participants. In addition, they receive exclusive news such as the CEO’s opinion and earnings estimates.

Brokerage Statements

Borrowing and short-selling is allowed. Interest is paid on cash held and charged on borrowed funds. These charges and payments along with any additional charges for news subscriptions or penalties for failure to trade are reflected on the brokerage statements.

Assessment

At the end of the simulation, we calculate the mean and the standard deviation of the ending portfolio values. In order to provide an incentive to students, a portion of the course grade is based on trading performance. Students are instructed in advance that 15% of their course grade is based on their relative performance in the simulations. Grades are assigned as follows: When students are first assigned a case to review and analyze, their initial step is to turn to information locations about which they are most familiar. If it is a closed, historical case that is either published in a casebook or purchased through an institutional publisher, e.g., a “Harvard

Case”, they will most likely just dive into the information prepackaged therein. If it is one that is a non-packaged, contemporaneous case, their first step will probably be to “Google” the company, turn to Wikipedia, or to go to a familiar source that deals with such firms, e.g., the company’s annual report and/or Yahoo Finance or Google Finance. The next step would be to download the financial statements of the firm to carry out ratio and other traditional analyses of it, to find articles about recent events associated with the firm’s activities, and to locate stock market data about its financial performance. After that, they’re often stuck!

The interaction of library instruction and assistance with that of contemporaneous finance case course teaching can overcome both this sudden impediment and, at the same time, provide a means for finance students to learn to investigate more deeply case company performance and the causes of it. It provides an opportunity for them to become familiar with the practical aspects of researching and analyzing the financial and operating performance of ongoing companies well-beyond the limits of more traditional case course settings. It further produces two other important related benefits -- it gives them an appreciation of the importance of searching for and incorporating externalities into the real world of financial analysis and decision making and some practice in carrying out such tasks prior to the time of their actually having to do so as company employees on the job. In fact, one of the major benefits of this approach to case company investigations is that the resultant reports offer a vehicle for students to attract the attention of the company the group has researched and analyzed as well as that of its competitors. This can thus be an important tool in their quest for employment in their field.

In order to accomplish these objectives it is important that the business librarian and the finance case professor work closely together. It is the job of the library instructor to present and discuss how to use the various sources of the available materials in these areas. At the same time, it is the responsibility of the case instructor to educate his/her students as to the manner in which that material should be integrated into and analyzed as a part of each case company assignment. Coordination takes place in three informational areas (deeper information, footnotes, and externalities), each discussed below.

Table 1. Student Assessment Based on Relative Trading Performance

<i>Performance</i>	<i>Percentage Grade</i>
< $\mu - 3 SD$	70%
> $\mu - 3 SD, < \mu - 2 SD$	75%
> $\mu - 2 SD, < \mu - 1 SD$	80%
> $\mu - 1 SD, < \mu + 1 SD$	85%
> $\mu + 1 SD, < \mu + 2 SD$	90%
> $\mu + 2 SD, < \mu + 3 SD$	95%
> $\mu + 3 SD$	100%

CONCLUSION

When we carried out this exercise, the mean ending portfolio value was \$1,234,835.93 which represented a 23.5% total return. The standard deviation of ending portfolio values was \$117,761.60 – just under 10% of the mean ending

portfolio value. The minimum and maximum returns were 4.3% and 54.4% respectively. Using the grading scheme in Table 1, this resulted in all grades clustered between 80% and 95%.

In our experience, the exercise appears to add value to the student experience. However, instructors must be prepared to

invest a significant amount of effort into developing and executing customized trading cases. This is an ongoing cost in that trades have to be executed manually. However, in times of very tight budgets it is a worthy effort to provide students

with this valuable tool. The cost of commercial trading software might be prohibitively high for a lot of schools, but the learning experience for the students is worth the extra effort of the instructor.

NOTES

- 1 See McClatchey and Kuhlemeyer (2000) for a survey on what types of market simulations are used by faculty
- 2 For different simulations see for example Angel (1994), Cheng (2007), Maxam and Maxam (2003), Lyman and Stone (2006), and Cooper and Grinder (1997).
- 3 Our simulation is different from FTS in that FTS has two simulations one with real data called *The Real Time Trader* (where you can change the parameter, but it uses real market information and runs over several weeks) and one that is case based, called *FTS Markets*. This one is fictitious, but runs only for a few minutes per trial. The RE1 case used in this paper to compare student results is from that application.

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Preparing the Statement of Cash Flows Using the Balance Sheet “Squeeze” Spreadsheet

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The statement of cash flows (SCF), established pursuant to Statement of Financial Accounting Standards No. 95 (FAS 95), is perhaps the most useful of the standard financial statements—balance sheet (BS), income statement (IS), and SCF—in evaluating the financial viability of a company, particularly a small business. Unfortunately, the SCF is probably the least understood of the three statements and the most difficult to prepare, and is frequently not included in the financial statement compilations issued by accountants for many small businesses. This paper describes a spreadsheet methodology commonly employed in private industry to facilitate preparation of the SCF, which can be suitable for teaching accounting and finance students at the undergraduate level.

Understanding cash flow is essential for accurate analysis of the financial condition and viability of any enterprise. Among the standard financial statements specified by

Generally Accepted Accounting Principles (GAAP)—balance sheet (BS), income statement (IS), and statement of cash flows (SCF)—the SCF may be the most important of all, particularly in analyzing the creditworthiness of small businesses. Unfortunately, perhaps because the SCF is the one basic statement that is not prepared more or less directly from a trial balance, it is usually the last one taught to accounting students, and it is understood by very few non-accountants.

Accountants for many small businesses often omit the SCF (and footnotes) in preparing compilations of financial statements. This presents an obvious problem for users seeking to understand cash flow, such as bank lending officers charged with making small business loans. Such a user must either prepare a cash flow statement with the information available, or request such a statement be included in any additional information to be provided.

What is needed is a methodology that can be useful in preparing the SCF or in validating a SCF prepared by others.