

Developments in Business Simulation & Experiential Exercises, Volume 14, 1987

SIMULATED STOCK BROKER

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ABSTRACT

Teaching an introductory course in investment could become more fun and stimulating if students were given an opportunity to practice what they learned in the classroom in real-world circumstances. This could be done in two ways. The first is investing real money in the real market and taking the risk of losing it all. The second way is to have access to a simulated stock broker with all the real-life details except for the pecuniary losses. This paper intends to describe how a stock market game could be developed on an electric spread-sheet and then be incorporated as part of the assignment in an introductory investment course.

INTRODUCTION

The experiential method of learning should be utilized to its fullest potential in the teaching of an introductory course in investment. Such courses are usually comprised of an explanation of techniques and procedures that should be followed as part of a sound investment strategy. Although the techniques are based on economic and statistical theories, overall the course has a practical orientation as opposed to the sheer theoretical. Students would be able to better comprehend the potentials and limitations of those techniques if they were put in a situation where they could personally apply those techniques. There are so many quantitative and qualitative variables involved in investment decision making that only actual participation in the investment market can guarantee that one has been exposed to all of them.

However, there is one important problem with the application of the experiential method of learning in the teaching of an investment course. It could be expensive. To form even a small portfolio of securities one requires at least a few thousand dollars. There are also other costs to consider, such as commission costs and the possibility of capital losses. For a completely diversified portfolio the initial cost could run up to \$100,000 for each student in the class. It is obvious that experiential learning, with all its attractiveness, could not be implemented on a large scale.

There is, however, another alternative which delivers almost all of the benefits associated with an experiential education and yet bears relatively little cost. This alternative is the use of a simulated stock broker. In a broad sense, simulation is described as a methodology for conducting experiments using a model of the real system. Traditionally, instructors of investment courses have required students to do pretend investing. Typically, on a certain date students were assumed to have some substantial amount of cash that they could invest in securities during a specific period with the intent of making a profit. How realistic the game becomes depends on how much time and energy the instructor can spend on controlling and monitoring the transaction activities of the students, which often times amounts to a formidable task.

The purpose of this paper is to show how an electric spread-sheet could be used to effortlessly generate and monitor a simulated investment environment with the highest level of conformity to realism.

In the next section the structure of such a game will be carefully described. The final section will deal with the pedagogical aspects of the application of the game.

DESCRIPTION OF THE GAME

In reality buying and selling stocks is done through stock brokers. Therefore, the first thing a potential investor has to do is to open an account with a broker. That means we could simulate the stock market as long as we could come up with a computer program that would simulate all the functions of a typical brokerage house. In other words, we need a program that could carry out buy and sell transactions at current prices, keep track of dividends and capital gains or losses, charge a commission cost, and generate a statement of the account on command.

The game we have developed actually does all the functions mentioned above. Upon the entry of his/her name the user will be given an account of \$100,000. To make the game as real as possible the program automatically uses the current closing prices of the stocks as reported by the New York Stock Exchange and copied on the data disk. This means that the list of the prices should be updated on a daily basis. This could be done by subscribing to the Dow Jones Retrieval System. At the end of each day the closing prices of the day could be retrieved through telephone and directly copied on the data disk. The user could start trading at current prices any time he/she wishes. Stock price is, therefore, one variable that the user cannot change. This greatly reduces the chance of cheating. Each transaction will be recorded along with the commission cost which is 2.5% of the value of each transaction. This cost will be deducted from the available cash.

The program is run on an electric spread-sheet known as Lotus 1,2,3. The spread-sheet is divided up into two main areas. The first area is devoted to the account of stocks that are already owned. It shows the name of the player, names and quantity of the stocks along with their market price per share. Upon the selection of a stock its current price will be automatically retrieved and used to calculate the value of the trade. Also the commission cost will be calculated and recorded against the user's available cash. The second area is the selling area where the sale of stocks takes place. In this area the purchase quantity and price is compared with selling quantity and price. Any capital gains or losses will be automatically calculated and added or deducted from the cash. Another interesting feature of the game is that it would be possible to record any dividends paid by the company. The dividend data should then be provided along with the closing prices.

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TABLE 1
PORTFOLIO REPORT

		ACCOUNT NUMBER	M08		AUGUST 8, 1986		
		ACCOUNT BALANCE	\$99,982.81				
		CASH AVAILABLE	\$68,826.01				

STOCK NAME	NUMBER OF SHARES	PURCHASE PRICE	VALUE	VALUE AND COMMISSION	CURRENT PRICE	VALUE	UNREALIZED GAIN/(LOSS)
B M C	250	\$5.25	\$1,312.50	\$1,345.31	\$5.50	\$1,375.00	\$29.69
D P L	150	\$26.75	\$4,012.50	\$4,112.81	\$26.63	\$3,993.75	(\$119.06)
D E I	220	\$24.38	\$5,362.50	\$5,496.56	\$25.25	\$5,555.00	\$58.44
E G G	330	\$30.00	\$9,900.00	\$10,147.50	\$28.88	\$9,528.75	(\$618.75)
H R E	275	\$25.25	\$6,943.75	\$7,117.34	\$25.75	\$7,081.25	(\$36.09)
K D I	175	\$16.38	\$2,865.63	\$2,937.27	\$16.13	\$2,821.88	(\$115.39)
TOTAL			\$30,396.88	\$31,156.80		\$30,355.63	(\$801.17)

REALIZED GAINS/(LOSSES) FROM SALE OF STOCK

STOCK NAME	NUMBER OF SHARES	PURCHASE PRICE	VALUE	VALUE AND COMMISSION	CURRENT PRICE	VALUE	UNREALIZED GAIN/(LOSS)
D E I	20	\$24.38	\$487.50	\$499.69	\$24.50	\$490.00	(\$9.69)
E G G	30	\$30.00	\$900.00	\$922.50	\$30.50	\$915.00	(\$7.50)
TOTAL			\$1,387.50			\$1,405.00	(\$17.19)

Table 1 presents a sample report on the status of a portfolio. To explain how different items are calculated consider BMC stock whose number of shares and purchase price are in cells B10 and C10 respectively. The beginning balance of \$100,000 is in cell D1, while the commission cost of 2.5% is in cell D4. Given this information, the total value of BMC stock is computed as follows: D10: +B10*C10 or (\$1,312.50 which is the product of 250 shares times \$5.25 price per share). The total cost of purchasing BMC stock would be calculated by the following command: E10: +D10+D10*\$D\$4 which simply adds 2.5% commission cost to the total value of BMC stock. To obtain the current total value of BMC, or \$1375, we have: G10: +F10*B10. Finally, unrealized gains/ losses can be computed by: H10: +G10-E10.

Using the replicate command, the unrealized gains/ losses for other stocks can also be obtained. Also, the sum of each desired column can be computed by using the command SUM. For example, the sum of the value of the stocks in Table 1 can be computed by using: @SUM(D10..D15) which results in \$30,396.88 in cell D17. As to the account balance the following command should be used: D2: +D1-H32, where H32 is unrealized loss. Finally for the cash available we can use: D3: +D1-E17+H32 which takes away from the beginning balance of \$100,000 the cost of all the purchased stock along with \$17.19 in capital losses.

APPLICATION OF THE GAME

The primary objective of the game is to provide an artificial environment where students can pretend to be securities investors. The game is especially designed for use in an introductory investment course. No special background is needed to play the game. Students are supposed to develop

an expertise as they play the game and see the results of their actions.

In order to provide the incentive to take the game seriously, it is necessary to make the game a part of the course assignments and devote perhaps 15% of the course grade to it. That way students are bound to avoid taking unnecessary risks and try, instead, to make financially sound decisions. In a sense, getting a good grade would be the equivalent of potential financial gains in the real market, whereas getting a "bad" grade would be a substitute for potential financial losses that may occur in reality.

It is also essential to explicitly set a time period for the game. For colleges on semester basis three months is a long enough period for the game. Of course the longer the time period, the better the chance to experience wide price fluctuations and other recurring market events. Since some time is needed to familiarize students with basic financial jargon it is wise not to set the start date of the game early in the course. Start and stop dates should definitely be specified. It is only between these two dates that students are allowed to make any transactions they want.

From the outset students should be required to submit weekly statements of their accounts. It is, however, final statements that should be used for grading. These statements should be ranked according to their cash value. The higher the figure, the higher the grade. The final statement could very well be accompanied by a short paper explaining why the 187 securities were bought, sold, or held during the game.