

New Horizons in Simulation Games and Experiential Learning, Volume 4, 1977

A SECURITIES DEALER SIMULATOR

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INTRODUCTION

Business games have traditionally exploited the firm's interface with product markets; in fact many of the pioneering games [2, 3] were explicitly or de facto marketing games. More recently some interest has shifted to financial markets, and we have seen the development both of investment games {5} and of general or special purpose games which incorporate some aspects of financial markets [1,4].

In using games which generate stock prices for the competing firms, the author has observed considerable player interest in stock price comparisons (sometimes beyond that which could be justified by the quality of the stock price model) and even the occasional development of an informal market. Invariably, though, the rigors of bookkeeping would cause the collapse of this market before the end of the term. Given the assumption that student interest is a resource generally worth exploiting, a preliminary attempt was made at computerizing the bookkeeping for such a market. Eventually a program set evolved which has proven satisfactory in use.

Experience with the simulator has generated some interesting research questions which have not up to now been tackled due to the small student volume accessible to the course in which it has been used. Some of these are:

1. What correspondence exists between success in game management and success in portfolio management?
2. Does the opportunity to invest alter decision-making behavior in the game?
3. What personality characteristics or group interactions affect the propensity to invest in one's own firm?

The Simulator

As in most games, no attempt is made to duplicate the real world in full detail. Accordingly all transactions take place on the fictional Nuevo Munich Securities Exchange under the rules outlined in the student handout presented below as Figure I. The brokerage firm employed is A.E. Newman & Son.

The cycle of play is as follows:

1. Students learn initial financial conditions of firms.
2. Referee calls program MARKET, initializes system.
3. Referee calls program INVEST, generates reports showing each player his cash stake (Figure IIa).
4. Players prepare TRANSACTION ORDERS (Figure III).
5. Referee calls program INVEST, inputs player transactions, generates reports (Figure ITh).
6. Game is played one quarter.
7. Referee calls program MARKET, updates financial market information.

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8. Referee calls program INVEST, generates a report on the status of each player's portfolio (Figure II c).
9. Return to step 4. This cycle then continues to the end of play.
10. Optionally, at the end of play, the referee may call program INVEST and close out all portfolios, thus permitting a final dollar comparison of results.

FIGURE 1

NUEVO MUNICH SECURITIES EXCHANGE-----

SUMMARY OF CONDITIONS OF TRADE

- I. Insider trading is forbidden. An officer of a firm may not engage in short sales of his company's stock, nor may he/she sell stock in his company held for less than one year (except under conditions outlined in VI, below).
- II. Commissions shall be charged as follows:

Common stock purchase or sale (over \$25/share)	1.25%
Common stock purchase or sale (under \$25/share)	1.50%
Bond purchases	\$5/bond
Commercial paper	5% of interest earned
- III. Neither commercial paper nor short positions may be acquired on margin.
- IV. When a short sale is executed, the client must cover the short position by depositing with the broker an amount equivalent to 150% of the gross proceeds of the sale. This deposit account will be adjusted quarterly to maintain parity with the most recent closing price of the stock.
- V. Income taxes will be withheld and paid quarterly at a rate of 50% on ordinary income and 25% on capital gains. All earnings are ordinary income except gains/losses on securities held for 6 months or longer. There is no provision for carry forward or carryback of losses.
- VI. A broker may call any or all margin accounts at any time, liquidating any or all positions for that purpose. No more than 50% more than the current short-term rate may be charged on margin accounts.

FIGURE II

(a)
 A. E. NEWMAN & SON, BROKERS
 BOX 69, NUEVO MUNICH
 STATEMENT OF ACCOUNT OF RALPH DAY
 AS OF DAY 30 OF QUARTER 24

CASH BALANCE	\$ 100000
MARGIN OWED	\$ 0
ORDINARY INCOME	\$ 0
CAPITAL GAINS	\$ 0
TAX OWED	\$ 0
COMMISSIONS PAID	\$ 0

(b)
 A. E. NEWMAN & SON, BROKERS
 BOX 69, NUEVO MUNICH
 STATEMENT OF ACCOUNT OF CARL NIELSEN
 AS OF DAY 1 OF QUARTER 25

STOCK AND BOND HOLDINGS

FIRM	TYPE	UNITS	DATE	BASIS (\$/UNIT)	RECENT QUOTE
1	COM. STK.	300	24	101.250	100.000
2	20 YR. BBSL.	25	24	805.000	800.000

SHORT POSITIONS

FIRM	SHARES	BASIS/SHARE	QUOTE
3	100	98.75	100

90 DAY COMMERCIAL PAPER OWNED \$ 50000

OFFSET DEPOSITS ON SHORT POSITIONS \$ 15000

NEW CAPITAL ADDED	\$ 20000
CASH BALANCE	\$ 14625
MARGIN OWED	\$ 0
ORDINARY INCOME	\$ 0
CAPITAL GAINS	\$ 0
TAX PAID	\$ 0
COMMISSIONS PAID	\$ 6.25

(c)
 A. E. NEWMAN & SON, BROKERS
 BOX 69, NUEVO MUNICH
 STATEMENT OF ACCOUNT OF BERNIE KEYS
 AS OF DAY 30 OF QUARTER 25

STOCK AND BOND HOLDINGS

FIRM	TYPE	UNITS	DATE	BASIS (\$/UNIT)	RECENT QUOTE
3	COM. STK.	500	24	101.250	100.000
4	COM. STK.	50	25	0.000	100.000

SHORT POSITIONS

FIRM	SHARES	BASIS/SHARE	QUOTE
1	500	98.75	50

OFFSET DEPOSITS ON SHORT POSITIONS \$ 37500

CASH BALANCE	\$ 63884.38
MARGIN OWED	\$ 0
ORDINARY INCOME	\$ 1384.38
CAPITAL GAINS	\$ 0
TAX OWED	\$ 692.19
COMMISSIONS PAID	\$ 28.12

FIGURE III

A. E. Newman & Son, Brokers
Box 69, Nuevo Munich

TRANSACTION ORDER

Account of _____

Execute Order on Day 90 of Quarter # _____

SALES ORDERS: COMMON STOCKS AND/OR BONDS

<u>Number in Block</u>	<u>Firm Number</u>	<u>Bond or Stock</u>	<u>Date Acquired</u>	<u>Number to Sell</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

BUY ORDERS: COMMON STOCKS AND/OR BONDS

<u>Firm Number</u>	<u>Units to Buy</u>	<u>Stock or Bonds</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

FIGURE III (cont'd)

ORDERS FOR TERMINATION OF SHORT POSITIONS

<u>Number of Shares</u>	<u>Firm Number</u>	<u>Basis \$/Share</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

ORDERS FOR SHORT SALES

<u>Firm Number</u>	<u>Number of Shares</u>
_____	_____
_____	_____
_____	_____
_____	_____

MAXIMUM \$ INVESTMENT IN 90 DAY COMMERCIAL PAPER AUTHORIZED _____

(Client's Signature)

Portability

At the time of this writing, the simulator is specialized to the ØPSTAC game, and application to other games will undoubtedly require some adaptation. Nevertheless, the relevant features of this game probably encompass the financial aspects of most general purpose games, so that adaptation is likely to involve more deletion than addition of features. These features include common stock which may yield cash and/or stock dividends, stock splits, new issues of common stock, a single series of bonds issued by each firm, and a commercial paper market. The time interval of play is a quarter, and players normally run the firms six to twelve quarters in an academic term.

The current implementation of the simulator is in BASIC on a 48 k IBM 5100 with printer and auxiliary tape drive. A feature of this system of which advantage has been taken is separate direction of output to both CRT screen and printer; these aspects of the programs would need adaptation for implementation on other systems. This is for convenience only, however, and an earlier version ran without difficulty on a conventional time sharing system.

Summary

A securities dealer simulator has been developed which shows interesting possibilities both for course development and as a research tool. A potential user would almost surely have to adapt the system to his needs, but adaptation would be far less difficult than independent development. Listings are available on request from the author, as are IBM 5100 tapes on an exchange basis REFERENCES

1. Churchill, Geoffrey, Sandra F. Beldt, John Y. Coffman, et al, ØPSTAC: Operational Planning, Strategy, and Tactics: A Decision Oriented Management Game, (Atlanta: Georgia State University, fifth revision, 1974).
2. Day, Ralph L., Marketing in Action - A Decision Game, (Homewood, Ill.: Irwin, Revised, 1968).
3. Jackson, James R., UCLA Executive Decision Game No. 2, (Los Angeles: Graduate School of Business, U.C.L.A., undated).
4. Nichols, Arthur C. and Brian Schott, SIMQ - A Business Simulation Came for Decision Science Students (Dubuque: Kendall/Hunt, third edition, 1975).
5. Nielsen, Carl C., The Investment Game: Selection and Management, (Belmont, Calif.: Wadsworth, 1974).