Portfolio Construction in Global Financial Markets

Dallas Brozik and Alina M. Zapalska*

Abstract

This paper presents a classroom simulation that can be used to introduce the concepts of portfolio management and asset allocation in the presence of global markets. While there are portfolio management games and stock trading games that are designed to cover an entire semester, this simulation provides a single period introduction to portfolio management. The simulation also creates an environment in which students discover how exchange rate volatility can affect investment returns of global funds.

Introduction

Teaching and learning about global and international issues consist largely of presenting and discussing basic economics and financial principles as they apply to international activities. Since the foundation or core of the economics and finance curriculum is teaching and learning about the basic principles within both disciplines and how they are applied, activities related to international trade or international finance can be included as another aspect of these areas. Choosing which of the many concepts related to international trade or finance should be taught is in itself an exercise in judgement since the amount of time available for focusing on these concepts is scarce relative to the topics that should be taught.

There is general agreement that students should be familiar with and understand why international trade occurs, how the US companies conduct international trade, how international trade is financed, and how nations restrict and encourage international trade. While studying and learning about topics related to international trade, students should be able to recognise that costs and benefits are always hard to measure and evaluate both in short-run and the long-run situations. This is a difficult task when analysing issues related to global economy and particularly to such concepts as foreign exchange rates.

Deciding which international concepts to teach is the first step. The second step is the decision of how to teach the selected concepts. A major factor determining teaching effectiveness is the method chosen, and an instructor who has a relatively good understanding and appreciation of teaching international issues can try new and different activities in the classroom (Torney-Purta, 1996).

A variety of teaching techniques can be used including debates, case studies, worksheets, class surveys, writing projects, graphing exercises, data analysis and class discussion. It has been recognised that there are also many opportunities to integrate simulations and games into teaching and learning international concepts (Zeff, 2003). Games and simulations can be used to demonstrate principles and provide experiential learning. This type of active learning provides both students and instructors with a break from the traditional classroom lecture and can be used to highlight and support lecture-related materials. Interactive learning activities can be designed to be short, taking less than a single class period, or long enough to span several class periods.

Single-period activities have several advantages. A single-period game or simulation can be rich enough to provide a multi-level learning experience. Several different interactions and principles can be demonstrated with a properly constructed single-period simulation. The richness of the experience can then serve as a springboard for several future classroom discussions or lectures. A single-period activity also is flexible. An instructor can move such an activity fairly easily if it is appropriate to reschedule it; multi-period activities can make the instructor a prisoner of the calendar.

The subject of the game or simulation can often dictate the length of the activity. Simple concepts, like a demonstration of the free rider problem in economics, may require multiple repetitions of short activities. Simulation of the complexities of bank management can span an entire term. Creating single-period games and simulations that span multiple periods requires that the designer isolate a fundamental concept to be demonstrated and develop a scenario that will play smoothly.

The lessons learned from using simulations and games may vary in the level of economic sophistication of the students (Ellington and Fowlie, 1998). Games and simulations can empower students by allowing them to take the initiative and create an environment of peer-based learning. This allows students to work in teams constructing knowledge together, providing insight and motivation to each other (Ruben, 1999). This paper describes how teachers can use a simulation to teach portfolio construction and asset allocation in a global economy.

This paper presents a portfolio simulation that spans several planning periods yet can be completed in a single class period. The simulation can be used to introduce the concepts of portfolio management in a global economy to inexperienced individuals and can thus serve as a good introduction to this topic. This simulation also creates an environment in which students discover how exchange rate volatility can affect investment returns of global funds.

Literature review

The recent literature in college educational techniques indicates a steadily increasing degree of interest in the use of active learning with simulations and experiential learning (Bouton and Garth, 1983, Cooper and Mueck, 1990 and Maler and Keenan, 1994). In particular, the analysis of the effectiveness of business simulations and experiential learning reveals a number of studies that support the usefulness of the games and simulations (Becker, 1997; Johnson and Johnson, 1989; Sharan *et al*., 1984; Zapalska and Brozik, 1998).

Simulations contribute to the learning process, particularly in transferring learning from the conceptual base to its ultimate application (Jones, 1998; Durham *et al*., 2007). A strong relationship between the degree of perceived realism and the perceived contribution of the simulation or game has been observed in most of the simulations discussed (Lantis *et al*., 2000). These exercises were developed as real world simulations, and they have proven excellent vehicles for encouraging deep learning and improving student appreciation of the complexity of business.

Another reason for the use of games and simulations is that they provide students with an alternative to traditional classroom methods (Durham *et al*., 2007). Games and simulations can be quite useful in illustrating how real institutions function and allow students to see how a business or an institutional structure can affect how decisions are made in the real world. The instructor must always keep in mind that games and simulations must fit the educational purpose of the course, but the use of such alternative teaching techniques can improve student learning.

A number of games and simulations have been developed to enhance students' learning in economics and finance (Wilson, 2005). These exercises create an environment in which students have the opportunity to experiment with new concepts in market situations. For example, Ball and Holt (1998) describe a classroom market that permits a comparison of trading prices for an asset with its fundamental value. The exercise provides an interactive framework to facilitate discussion of rational expectations, discounting, and speculative price bubbles where students become active players. Similarly, Laury and Holt (2000) complement the literature on classroom experiments by describing the role of banks in creation

of money where students become involved in the money-creation process through an exercise in which they take on the roles of a banker, depositors and borrowers.

Gitman (1974) illustrates a game designed to provide players with experience in the development and implementation of an investment strategy where players are provided with an uncertain environment in which they have to make strategic decisions to maximise their wealth. Wingender and Ball (1988) present a portfolio management simulation where students construct and manage simulated portfolios to test and apply various finance models and formulas, and Palia (1991) introduces product portfolio analysis where students can apply their knowledge of portfolio analysis in strategic market planning.

In contrast to the previously discussed papers on portfolio simulations, the game presented in this paper provides a student-centered and problem-based learning instrument about portfolio analysis in a global economy. The players are expected to maximise returns on investment portfolios for various groups of investors and experience how exchange rates can affect returns in a global economy. Such experimental games provide students with a better understanding of the economic concepts because students learn from their own experiences. The use of experimental games contributes to students' learning and makes student classroom study more real as students become an important element in the learning process.

The simulation

This portfolio management simulation has been designed to provide students with the opportunity to make portfolio decisions in the context of a dynamic global financial market. Students create three different portfolios whose returns are determined for each period by a roll of the dice. The randomness introduced by the dice simulates real world market conditions and eliminates the possibility of any player being able to predict the direction of the simulation.

The simulation focuses on asset allocation and provides the players with several asset classes to choose from for the various portfolios. By keeping the focus tight and providing all necessary information, it is possible to simulate four different portfolio decision periods in a single class period. This allows the students to experience the results of their decisions immediately, to change their portfolios in response to market conditions, and to see the effects of those changes. The players also learn how the volatility of foreign exchange rates can affect the returns of the investments from outside the home country.

In order to complete the simulation within a single period, the students must be prepared when they walk into class. Prior to the simulation, students are divided into groups of two or three and given the Simulation Instructions (Document 1). The students are required to devise three separate portfolios (conservative, middle-of-the-road and aggressive) using assets from six specified classes (government bonds, corporate bonds, blue chip stocks, midcap stocks, speculative stocks and international stocks) and cash. By requiring the students to prepare the initial portfolio allocation outside of class, each team has the time to develop strategies and contingency plans for various possible market conditions. The information packet also includes the forms necessary to record decisions and results.

The Simulation Support Documents (Document 2) give the instructor the forms needed to conduct and record the results of the simulation. These forms include a Summary of Dice Rolls sheet that identifies the period returns for each asset class and for the exchange rate between dollar and foreign currencies for each roll of the dice (a pair of dice must be provided by the instructor). This sheet translates the probability distributions for the returns of the asset classes to the roll of the dice. There is also a form for recording the results of each period and a form for summarising the results of the entire simulation. It can be useful to copy these forms onto transparencies and display the information for the entire class.

Document 2 also includes four different news releases. These documents provide information that can be presented to students between rounds so that it might affect their decisions for the subsequent portfolio allocation. The important thing to note about this information is that it is of no use whatsoever in the simulation. While the words and ideas presented may sound similar to news releases heard every day, the mere existence of the words does nothing to change the probability distributions of the returns of the asset classes. Less sophisticated players may assume that the information has value and base their decisions accordingly. The value of information thus becomes a topic for discussion during the debriefing of the simulation.

The play of the game is straightforward. Each team of students enters the class with its initial asset allocation for each of the three different portfolios. The instructor then rolls the dice, and the count of the pips determines the period return on government bonds. The instructor rolls the dice five more times to determine the period return for each of the other five asset classes. The instructor then rolls the dice to determine the effect of exchange rate changes on the returns of the international stocks held in the portfolios. The entire process takes about one minute. The information is recorded on the Single Period Results summary sheet, and this can be displayed on an overhead transparency for a few minutes to assure that all teams have the correct value.

The teams now calculate the end-of-period value of their portfolios and determine the allocation of assets for the next period. Each portfolio starts with an initial value of $1,000,000. If, for example, a certain portfolio earned $100,000 during the first period, then there would be $1,100,000 to allocate for that portfolio for the second period. It is during this period of calculation and reallocation that the instructor may choose to display one of the news releases. If the returns have been low, the instructor can use either of the news releases that speak of current poor market conditions. The news releases have no effect on the next roll of the dice; they are there only to establish the value of irrelevant information.

After the teams have rebalanced their portfolios, the process is repeated. The instructor rolls the dice, the returns of each asset class and the effects of the exchange rates are determined, and the teams calculate the value of each portfolio and rebalance it for the next period. The instructor can display another news release during this period. The time needed to calculate the values of the portfolios and make the allocation decision is about 10 to 15 minutes. Even in a 50-minute class, there is sufficient time for at least three rolls of the dice and two rebalancings.

The fourth round of the dice is the final round. The value of each portfolio is calculated and reported to the instructor who records it on the Final Results sheet. It is a good idea to have this sheet as a transparency so that all teams can see the results for every team. It should be noted that there is no particular identification of any team. This is not necessary because the simulation has no winners or losers. Different teams can be making what they consider to be rational portfolio decisions, but the roll of the dice determines which is the most and least profitable.

Debriefing

It is important to provide an oral debriefing so that students can analyse and learn from what they have just experienced (Steinwachs, 1992). Debriefing a simulation encourages students to describe what just happened, how the events of the simulation validate or contradict theory, how real the simulation was, and if the process involved in the simulation accurately depicts reality (Petranek, 2000). It also gives students time to reflect and gain perspective, more carefully organise their ideas, and apply theory.

During the debriefing there should be a discussion on the Final Results that allows the comparison of results and identifies differences, both high and low, in the values of given portfolios. The debriefing can now be turned to the various teams, and they can be asked why they made the choices they did. This discussion shows that a simple difference of opinion can have tangible results on portfolio performance. This also illustrates why the various mutual funds in the market can

have different returns even if they have the same investment philosophy. The value of market information like the news releases can also be discussed.

The focus on the debriefing session should be on how and why the portfolio structure decisions were made. The results will indicate which strategies were the most and least profitable in this market session, but it should be pointed out that if the dice had fallen differently the results could have changed. The instructor is also expected to discuss how the volatility in exchange rates affected the investment returns. The debriefing session should enable students to recognise that despite the best intentions of the portfolio managers, the real world will have its own input to portfolio performance. By allowing students the ability to make multiple allocation decisions within a single period, they can see how different strategic and tactical plans may succeed or fail.

It is also important to involve students in expressing their learning experiences in written form. Integrating this simulation into a written assignment makes the students take the simulation more seriously and allows them to apply a more exacting analytical approach to the lessons learned.

Conclusion

The Portfolio Construction in Global Financial Markets simulation is a primary learning experience that can help the students understand some basic concepts through their own involvement in the learning process. Its strength derives from the fact that students learn by analysing their own behaviour and observations in a situation that imitates the real scenario of portfolio managers. The class interaction produces a role-playing situation that involves the student at an emotional level to the extent that great effort is made by the instructor to preserve the substantive aspects of the game. Students' observation of experimental games and the ability to connect the real-world analogues to events and factors in the simulation leads to an easier and less stressful learning environment.

The simulation creates a dynamic environment in which students make decisions concerning portfolio structure and see the results of those decisions. Personal involvement helps students retain the experience and provides a powerful technique that increases student interest and understating of the basic economic concepts. Students are able to see the interconnectedness of political, social, interpersonal, economic and historical factors.

The simulation focuses on the decision-making process during several rounds completed within a single class period and introduces students to portfolio management and the effect that changing exchange rates can have on a portfolio.

The simulation does not require a detailed knowledge of the various asset classes that generate returns, so the simulation can be conducted with students with little financial and economic sophistication. The simulation can be used early in an investments class to introduce students to the broad concept of the portfolio or later in the class to allow students to exercise their decision-making capabilities in a dynamic market setting.

One key aspect of the simulation is that there are no winners or losers. The purpose of the exercise is to explore decision-making techniques and see the results of specific decisions. The debriefing session allows the class members to discuss the nature of their decision making, and comparisons can be made between various teams in a noncompetitive environment. Everyone can learn from everyone else. Portfolio Construction in Global Financial Markets provides instructors with an effective interactive learning tool that can be used to augment traditional teaching techniques and give students new insights into what is sometimes challenging material.

DOCUMENT 1

SIMULATION INSTRUCTIONS
PORTFOLIO CONSTRUCTION IN GLOBAL FINANCIAL MARKETS

Background

The purpose of a portfolio is to diversify investments and possibly control risk. Portfolios that are widely diversified tend to have returns similar to the overall market. Portfolios that have a more narrow scope may provide returns similar to a specified economic or geographic segment. Even such narrow portfolios can protect the investor from the volatility of returns of a single stock. Portfolios can be useful to all types of investors.

You and your team members are the managers of a family of mutual funds. Each of these funds offers investors the chance to own part of a portfolio, but the portfolios are constructed differently to meet the needs of different investors. The funds you offer are:

- *Stay-at-Home Fund (SH)* – This fund is designed to meet the needs of more conservative investors, like retirees and those who are not inclined to take risk. While these investors do not want to take a lot of risk, they need as much return as possible in order to supplement their current income and meet living expenses.

- *Out-in-the-World Fund (OW)* – This fund is meant for people who are currently employed and still have several years to work. These investors are able to take a small to moderate amount of risk in hopes that the returns from the portfolio will augment future retirement income. They will tolerate some losses periodically, but they want the fund to have overall positive returns more often than not.

- *Life-on-the-Edge Fund (LE)* – This fund is designed for investors who are willing to take high amounts of risk. They have sufficient other income to meet their living requirements, but they would really like to be much wealthier than they are now. They will tolerate losses more easily than other investors, but they expect higher returns for bearing this additional risk.

Your job is to construct different portfolios from the assets currently available in the market that meet the needs of these different classes of investors. Once you have made your initial allocation of funds, time will pass in the market, and the success of your decisions will be determined. You will then be able to rebalance your portfolio for the next period. After several periods, the overall results will be reviewed to determine whether or not you were successful in managing these portfolios.

Possible investments

In constructing your portfolios, you will be able to choose between several different types of investments. The distribution of returns for each is shown below. You will be able to choose any of these investments for any of the portfolios, and you can put several of these investments into any specific portfolio. Note that a portfolio contains more than one of the possible investments.

Cash – Funds held as cash will earn 1%.

Government Bonds – High-grade, low-risk federal and state debt securities.
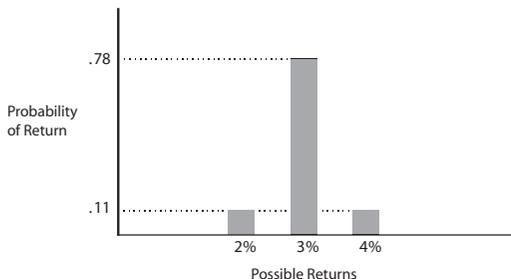
Corporate Bonds – High/medium-grade, low/medium-risk corporate debt securities.
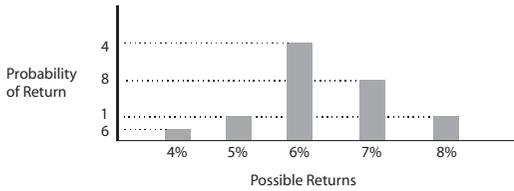
Blue Chip Stocks – High-grade/low-risk corporate equity securities.

MidCap Stocks – Medium-grade/medium-risk corporate equity securities.

Speculative Stocks – Low-grade/high-risk corporate equity securities.
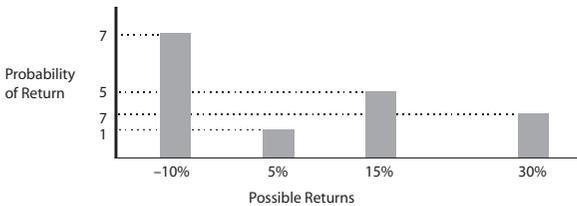
International Stocks – Medium-grade/medium-risk international equity securities.
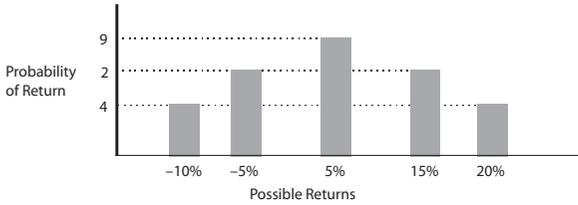
One-period Change in the Exchange Rate between the Dollar and Other Currencies (This value reflects the effect on the total return of international investments)
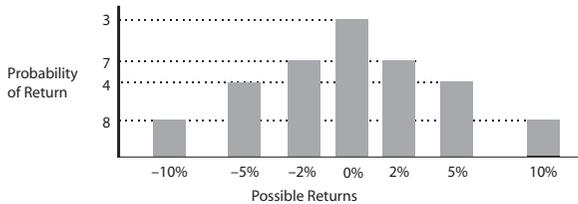
Portfolio formation

You and your team have been allocated $3,000,000 of which $1,000,000 must be used for each of the specific funds (SH, OW, and LE). For each of the funds, do the following:

Outside class:
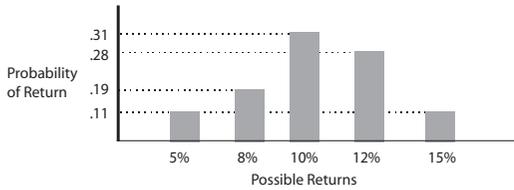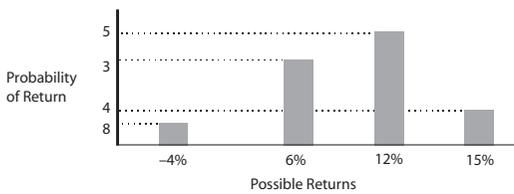
1. Consider the investment goals for each fund. Think about what types of investors provided the money for the fund and what types of investments would be appropriate for these individuals.
2. Allocate the $1,000,000 for each fund. You must select at least two of the six possible investments for each fund (after all, you do want some diversification). No more than 70% of the money can be put into any single investment. For example, you may choose to make the following investments for the SH Fund: $500,000 in Corporate Bonds, $300,000 in Blue Chip Stocks, $100,000 in Speculative Stocks, and $100,000 in International Stocks. Remember that you have $1,000,000 for each Fund, so you must construct three different portfolios to meet the needs of the different investors.
3. Notice that investment returns of International Stocks will be affected by the fluctuation in an exchange rate of the US dollar. For example, if you allocated $100,000 in International Stocks and the US dollar depreciated by 10 per cent

     then your returns on International Stocks will decrease by 10 per cent, that is a rate of depreciation of the US dollar.

4. Use the attached form to designate how much money you chose to put into each investment for each portfolio.

In class:

5.   In class, the instructor will roll the dice. For each possible investment, the dice will decide which possible return actually occurred. For example, the dice may determine that Corporate Bonds provided a 7% return for the period. The dice will also be rolled to determine the effect that a change in exchange rates will have on the realised returns of any investment in international stocks.

6.   Using the form, determine how much money you made or lost on each investment. For example, if you allocated $200,000 to Corporate Bonds, you earned $14,000 for you portfolio.

7.   Find the new total amount of money you have in each of your portfolios.

8.   You will now be given the opportunity to rebalance your portfolio. For example, you may originally have chosen to allocate $200,000 to Corporate Bonds for the SH portfolio. In light of the change to the portfolio, you may wish to change this allocation, either up or down. You may even choose to replace the Corporate Bonds with Government Bonds for the next period. You will need to review each portfolio and reallocate funds as necessary.

9.   The dice will be rolled again, and you will again determine how your portfolios performed in the new time period.

10. If time permits, you will be allowed to rebalance your portfolios a second time, and a third round of dice will be rolled.

11. At the end of the simulation, you will determine exactly how much money you have in each portfolio. Please note that having a lot of money in a portfolio may not be the best result; it also matters how you got it there. If you chose to make risky investments for a conservative portfolio, the extra money you may have earned was made by exposing your investors to too much risk.

12. A quick survey will be taken to determine how each group fared in the simulation.

Outside class:

Each group will prepare a report describing the results of the simulation. Only one report is required for each group. This means that you will have to work together on its construction and review the final product. Group work requires the input of everyone in the group in order to be successful. This report will include an explanation of why the original portfolios were constructed as they were and how this plan worked during the first round. For each subsequent round, the report should detail the reasons for making changes to the portfolios and how well that decision worked. A summary section should be included that reviews the overall simulation and your relative success in it. The original forms you used in class should be included as attachments to the report.

STAY-AT-HOME FUND

PERIOD 1

INVESTMENT	AMOUNT ALLOCATED ($)	RETURN EARNED	END OF PERIOD ($)
	END-OF-PERIOD PORTFOLIO VALUE		

PERIOD 2

INVESTMENT	AMOUNT ALLOCATED ($)	RETURN EARNED	END OF PERIOD ($)
	END-OF-PERIOD PORTFOLIO VALUE		

PERIOD 3

INVESTMENT	AMOUNT ALLOCATED ($)	RETURN EARNED	END OF PERIOD ($)
	END-OF-PERIOD PORTFOLIO VALUE		

PERIOD 4

INVESTMENT	AMOUNT ALLOCATED ($)	RETURN EARNED	END OF PERIOD ($)
	END-OF-PERIOD PORTFOLIO VALUE		

OUT-IN-THE-WORLD FUND

PERIOD 1

INVESTMENT	AMOUNT ALLOCATED ($)	RETURN EARNED	END OF PERIOD ($)
	END-OF-PERIOD PORTFOLIO VALUE		

PERIOD 2

INVESTMENT	AMOUNT ALLOCATED ($)	RETURN EARNED	END OF PERIOD ($)
	END-OF-PERIOD PORTFOLIO VALUE		

PERIOD 3

INVESTMENT	AMOUNT ALLOCATED ($)	RETURN EARNED	END OF PERIOD ($)
	END-OF-PERIOD PORTFOLIO VALUE		

PERIOD 4

INVESTMENT	AMOUNT ALLOCATED ($)	RETURN EARNED	END OF PERIOD ($)
	END-OF-PERIOD PORTFOLIO VALUE		

LIFE-ON-THE-EDGE FUND

PERIOD 1

INVESTMENT	AMOUNT ALLOCATED ($)	RETURN EARNED	END OF PERIOD ($)
	END-OF-PERIOD PORTFOLIO VALUE		

PERIOD 2

INVESTMENT	AMOUNT ALLOCATED ($)	RETURN EARNED	END OF PERIOD ($)
	END-OF-PERIOD PORTFOLIO VALUE		

PERIOD 3

INVESTMENT	AMOUNT ALLOCATED ($)	RETURN EARNED	END OF PERIOD ($)
	END-OF-PERIOD PORTFOLIO VALUE		

PERIOD 4

INVESTMENT	AMOUNT ALLOCATED ($)	RETURN EARNED	END OF PERIOD ($)
	END-OF-PERIOD PORTFOLIO VALUE		

DOCUMENT 2

PORTFOLIO CONSTRUCTION AND MANAGEMENT
SIMULATION SUPPORT DOCUMENTS
SUMMARY OF DICE ROLLS ON INVESTMENT RETURNS

GOVERNMENT BONDS

roll:	5	return:	2%
roll:	2, 3, 4, 6, 7, 8, 10, 11, 12	return:	3%
roll:	9	return:	4%

CORPORATE BONDS

roll:	3	return:	4%
roll:	5	return:	5%
roll:	2, 4, 7, 10, 11, 12	return:	6%
roll:	6, 8	return:	7%
roll:	9	return:	8%

BLUE CHIP STOCKS

roll:	5	return:	5%
roll:	2, 4, 10	return:	8%
roll:	3, 7, 11, 12	return:	10%
roll:	6, 8	return:	12%
roll:	9	return:	15%

MID-CAP STOCKS

roll:	2, 4	return:	−4%
roll:	3, 5, 10, 11	return:	6%
roll:	7, 8, 9, 12	return:	12%
roll:	6	return:	18%

SPECULATIVE STOCKS

roll:	2, 3, 4, 8, 10, 11, 12	return:	−10%
roll:	9	return:	5%
roll:	5, 6	return:	15%
roll:	7	return:	30%

INTERNATIONAL STOCKS

roll:	2, 5	return:	−10%
roll:	6, 10	return:	−5%
roll:	3, 7, 11	return:	5%
roll:	4, 8	return:	15%
roll:	9, 12	return:	20%

EXCHANGE RATE FOR THE U.S.DOLLAR

roll:	4	APPRECIATION	10%
roll:	6	APPRECIATION	5%
roll:	3, 5	APPRECIATION	2%
roll:	2, 7, 12	NO CHANGE	0%
roll:	9, 11	DEPRECIATION	−2%
roll:	8	DEPRECIATION	−5%
roll:	10	DEPRECIATION	−10%

SINGLE PERIOD RESULTS

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
GOVERNMENT BONDS				
CORPORATE BONDS				
BLUE CHIP STOCKS				
MID-CAP STOCKS				
SPECULATIVE STOCKS				
INTERNATIONAL STOCKS				
EXCHANGE RATE EFFECT				
CASH	1%	1%	1%	1%

FINAL RESULTS: PORTFOLIO VALUES

PORTFOLIO	SH	OW	LE
TEAM 1			
TEAM 2			
TEAM 3			
TEAM 4			
TEAM 5			
TEAM 6			
TEAM 7			
TEAM 8			
TEAM 9			
TEAM 10			

NEWS RELEASE 1

WASHINGTON, DC:
The National Economic Research Department has just released its latest economic forecast. The recent strong performance of the financial markets is expected to continue for the immediate future. The reduction in the foreign trade deficit coupled with the recent reports on factory orders indicate that the economy should remain strong and returns on investments should be high for the next period.

NEWS RELEASE 2

WASHINGTON, DC:
The National Economic Research Department has just released its latest economic forecast. The recent strong performance of the financial markets is expected to moderate in the immediate future. Indications of a lower number of housing starts and an increasing first time unemployment rate could create the conditions that stall economic growth. In such a climate, investors should expect weaker performance from their investments in the next period.

NEWS RELEASE 3

WASHINGTON, DC:
The National Economic Research Department has just released its latest economic forecast. Though the financial markets have been mixed recently, the next period is expected to show improvement in all areas. New housing starts and job creation data indicate that there will be more economic growth and that this growth should be reflected in the returns earned by investors.

NEWS RELEASE 4

WASHINGTON, DC:
The National Economic Research Department has just released its latest economic forecast. The recent weak performance of the financial markets is expected to continue for the immediate future. An unfavorable foreign trade deficit and increasing government debt both point to an upcoming period of poor financial performance.

References

Ball, S. and C. Holt (1998) Speculation and bubbles in an asset market. *Journal of Economic Perspectives.* 12 (1): 207–218.

Becker, W. (1997) Teaching economics to undergraduates. *Journal of Economic Literature.* 35(3): 1347–1373.

Bouton, C. and R. Garth (1983) *Learning in groups.* San Francisco: Jossey-Bass Inc.

Cooper, J. and R. Mueck (1990) Student involvement in learning: cooperative learning and college instruction. *Journal of Excellence in College Teaching.* 1(1): 68–76.

Durham, Y., T. McKinnon, C. Schulman (2007) Classroom experiments: not just fun and games. *Economic Inquiry.* 45 (1): 162–178.

Ellington, H. and J. Fowlie (1998) *Using games and simulations in the classroom.* London: Kogan Page.

Gitman, L. (1974) A description of FINSTRAT: a game of investment strategy. Association for Business Simulation and Experiential Learning. *Papers and Conference Proceedings: Simulations, Games and Experimental Learning Techniques.* (1): 108–115.

Jones, K. (1998) Simulations and examinations. *Simulation and Gaming.* 29(3): 331–342.

Johnson, D. and R. Johnson (1989) *Cooperation and competition: theory and research.* Edina, Minnesota: Interaction Bank Company.

Lantis, J., L. Kuzma, and J. Boehrer (2000) Active teaching and learning at a critical crossroads. In *The New International Studies Classroom: Active Teaching, Active Learning.* Boulder, Colorado: Lynne Rienner Publishers.

Laury, S. and C. Holt (2000) Classroom games: making money. *Journal of Economic Perspectives.* 14(2): 205–213.

Maler, M. and D. Keenan (1994) Cooperative learning in economics. *Economic Inquiry.* 358–361.

Palia, A. (1991) Strategic market planning with COMPETE product portfolio analysis package: a marketing decision support system. Association for Business Simulation and Experiential Learning. *Papers and Conference Proceedings. In Simulations, Games and Experimental Learning Techniques.* (18): 80–83.

Petranek, C. (2000) Written debriefing: the next vital step in learning with simulations. *Simulation and Gaming.* 31(1): 108–119.

Ruben, B. (1999) Simulation, games, and experience-based learning: the quest for a new paradigm for teaching and learning. *Simulation and Gaming.* 30(4): 498–506.

Sharan, S., R. Kussel, Y. Hertz-Lazarowitz, S. Bejarano, and Y. Sharon (1984) Cooperative learning in the classroom research in desegregated schools. Hillsdale, New Jersey: Lawrence Eribaum Associates.

Steinwachs, B. (1992) How to facilitate a debriefing. *Simulation and Gaming.* 23(2): 86–196.

Torney-Purta, J. (1996) Evaluating programs designed to teach international content and negotiations skills. *International Negotiations.* 3: 77–97.

Wingender, J. and S. Ball (1988) A simulation of investment analysis, portfolio management and reporting Lotus 1-2-3. Association for Business Simulation and Experiential Learning. *Papers and Conference Proceedings. In Simulations, Games and Experimental Learning Techniques.* (15): 102–105.

Wilson R. (2005) Targeting teaching: classroom games: candidate convergence. *Journal of Economic Journal*. 71(4), 913–922.

Zapalska, A. and D. Brozik (1998) The market game. *Journal of Business and Behavioral Sciences*. 4 (1): 38–48.

Zeff, E. (2003) Negotiating in the European Union: a model European Union format for individual classes. *International Studies Perspectives*. 3:265–275.

Contact details

Dallas Brozik
Professor of Finance
Division of Finance and Economics
Lewis College of Business
Marshall University
One John Marshall Drive
Huntington, WV 25755

Email: brozik@marshall.edu

Alina M. Zapalska
Professor of Economics
Department of Management
The U.S. Coast Guard Academy
27 Mohegan Avenue
New London, CT 06320

Tel: 860-444-8334
Fax: 860-701-6179
Email: Alina.M.Zapalska@uscg.mil

*   We would like to thank an anonymous reviewer for correctly pointing out that this simulation is intended to be used as an introduction to asset allocation and portfolio management. A more realistic simulation would require a more complex specification of the various returns distributions that takes into account the correlation of returns between the several asset classes.