IN PURSUIT OF STOCKHOLDER VALUE: REINFORCING CORE CONCEPTS IN A BUSINESS STRATEGY SIMULATION WITH A "SHADOW" STOCK MARKET COMPETITION

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ABSTRACT

Computerized business simulations have become popular classroom tools because they give students a hands-on decision making experience in a realistic context. Previous research indicates that two decision making biases, risk tolerance and financial conservatism influenced the success of teams in simulated business competitions. An intervention strategy, the use of a supplemental shadow stock market, is suggested to provide support to at-risk students as well as to increase learning of key strategic concepts by all participants.

INTRODUCTION

Stock market simulations are now frequently employed as experiential exercises in business education. Typically, participants "invest" imaginary funds in the stock market at current prices with the goal of achieving the highest valued stock portfolios after a set period of time. Instructors use the simulations to introduce trading strategies and the use of stock-market research materials without placing real money at risk.

Stock market simulations range from the formally organized (e.g., the Stock Market Game, SIFMA) in which students begin with an initial portfolio and access to a credit line for buying additional stock if they choose. Such simulations focus primarily on teaching the fundamentals of investments and stock markets, although a range of issues, from supply and demand to applied business mathematics can be addressed.

In addition, a wide array of less formally organized stock market simulations are available as well, but share essentially the same educational goals. The approach reported herein is a much simplified approach to a stock market simulation, appended to a business strategy simulation. While useful for introducing the basic of the stock market (even among some graduating students in a university business program, the stock market is an unfamiliar concept) it is primarily intended to make students aware of industry and competitive conditions, as well as mitigate excessively risk-averse behaviors in the management of their simulated companies.

BUSINESS STRATEGY SIMULATIONS

Business simulations are not new. For the past twenty years, instructors have used simulations so students could have the "hands-on" experience of running a business. Implicit in the use of this technique is the hope that students will be successful and the learning process will be a positive experience.

Unfortunately, the experience is not always positive. There are some students who do well in traditional classes and yet do not perform well in simulations. This reduces the chance that students will transfer knowledge from the simulation to the workplace. As instructors, we need to know what factors contribute to performance in simulations. Previous research studies indicate that risk aversion, tolerance for ambiguity, locus of control, and a cosmopolitan orientation can influence decision-making and hence organization performance (Kedia & Bhagat, 1988). Research in strategic management also indicates that a manager's goal orientation will impact a firm's position (Evans & Lindsay, 1996).

If these personal and goal orientations are significant for successful businesses, could they affect performance in business simulations? This question became the driving force for this research. Specifically, in this study, we examine the relationship between performance in a business simulation and personal and goal orientations of students – and the impact of participation in a shadow stock market exercise on those relationships.

As important as is the educational value of both the business strategy simulation and the shadow stock market competition, much of the motivational value comes from the competition. Students frequently become obsessed with strategy development and deployment on the one hand, and stock selection strategies on the other, in pursuit of winning performances.

LITERATURE REVIEW AND RESEARCH HYPOTHESES

Risk is the possibility of incurring a loss. Both scholars and practitioners maintain that decision-makers ought not to be risk averse because their organizations will forego opportunities for large payoffs (Majer, Bailey, Censor, & Bassin, 1989). Even though there is evidence that under-performing firms sometimes take more risk (Lee, 1997), there is substantial research that the most successful executives are also the biggest risk takers (MacCrimmon & Wehrung, 1990).

The Business Strategy Game (BSG) is used in this study (Thompson & Stappenbeck, 2008). With the BSG, there is ample opportunity to risk capital to expand production capacity, increase advertising and promotion expenditures, and aggressively market product without any guarantee of success. Since risk-taking is associated with higher performance, we hypothesize: (*1A) Students who have a high tolerance for risk will have a positive influence on their company's performance.*

Since the structure of participation in the shadow stock market encourages students to take large risks (i.e., there are rewards associated with "winning" in the form of extra credit

points, but no penalties for "losing" and no actual money at stake), we hypothesize that *(1B) Risk-averse students participating in the shadow stock market will be more encouraged to take business risks leading to a more positive influence on their company's performance.*

Tolerance for ambiguity is often associated with risk aversion and risk-taking propensity. Many situations in organizations are inherently ambiguous. For example, some economic forecasts suggest that business conditions are likely to improve while others suggest decline. A manager with low tolerance for ambiguity may waste precious time and other resources trying to collect additional information to eliminate ambiguity before making a decision. Since researchers, such as Schwenk and Mitroff (1982), have found that tolerance for ambiguity is associated with high performance, we hypothesize: (*2A) Students who have a high tolerance for ambiguity will have a positive impact on their company's performance.*

Much activity in the shadow stock market competition is oriented towards reducing potential sources of competitive ambiguity. Industrial conditions (e.g., supply-demand imbalances, supplier power, competitive groupings, and strategic benchmarking activities) help clarify the competitive landscape. Therefore, we hypothesize that *(2B) Low tolerance for ambiguity students participating in the shadow stock market will feel more comfortable making timely decisions, leading to a more positive influence on their company's performance.*

Locus of control has also received significant attention in the management literature (Rotter, 1990; Boone, de Brabander & van Witteloostuijn, 1996). Locus of control is the belief of an individual that he or she can or can not control relevant outcomes. An individual who believes that she or he controls outcomes is said to have an internal locus of control whereas an individual who believes that outcomes are determined by others is said to have an external locus of control. A willingness to take charge and act proactively is associated with an internal locus of control. In empirical studies, internals are rated higher than externals on performance (Marks, 1988). Since successful management often requires active and proactive participation rather than passive acceptance or reactive behaviors, it follows that high performance should be associated with an internal locus of control. Therefore, we hypothesize: (*3A) Students who have an internal locus of control will have a positive impact on their company's performance.*

Unlike the team-based business strategy simulation itself, the shadow stock market competition is an individual activity. As their portfolios grow or decline, participants receive more concrete feedback on the impact of their business decisions – not only on a personal level but also the potential impact on investors as a stakeholder group. Therefore, we hypothesize that *(3B) Participants in the shadow stock market with an external locus of control will be encouraged to be more proactive in their decision making leading to a more positive impact on their company's performance.*

Another individual difference variable is the relation between local versus cosmopolitan orientation (Gouldner, 1957). Interestingly, there has been little research on this construct in business organizations (Wright & Larwood, 1997). "Local" individuals identify with their immediate organization, its norms and values. "Cosmopolitan" individuals identify with the norms of professional societies and other reference outside their focal organization (Wright & Larwood, 1997). In the case in the BSG simulation, we believe cosmopolitans will look outside their immediate company, which originates in North America, and take a broader view of the total market available. Locals, on the other hand, will be less likely to conceptualize the entire market. Because local orientation limits the access to customers, we hypothesize: (*4A) Students who have a cosmopolitan orientation will have a positive impact on their company's performance.*

Participants in the shadow stock market competition quickly gain an appreciation for the importance of industrial and global conditions to the performance of their companies. Therefore, *(4B) Participants in the shadow stock market who have a local orientation will appreciate the broader context of their decision making, leading to a more positive impact on their company's performance.*

Goal orientation is also an important consideration when examining performance. In business, managers are becoming increasing aware of the necessity to incorporate continuous improvement into the manufacturing process. Indeed, total quality management guru, W. Edwards Deming, advocates a never-ending cycle of product design, manufacture, test, and sales (Evans & Lindsay, 1996). Such action can lead to higher quality that leads to higher productivity, which ultimately leads to competitive strength. This continuous striving to improve the company also allows managers to develop resources that discourage quick imitation by competitors and helps build up a sustainable advantage (Barney, 1997). In the simulation, some students explore incremental improvements over the ten decisions to improve their company. Other students focus on the end (e.g., having a high cash balance) throughout the simulation. Since research supports the belief that continuously improving a company can lead to success, we hypothesize: (*5A) Students who focus on the on-going operations of the company will have a more positive impact on their company's performance than will students who focus on end results.*

Participation in the shadow stock market reinforces the importance of long-term investor interests and building stockholder value. Therefore, *(5B) Participants in the stock competition with a short-term bias will be forced to focus on value-producing activities leading to improved company performance.*

METHOD

SAMPLE

We used a written survey to obtain information on the attitudes of respondents. The sample includes 260 students enrolled in capstone strategy classes of a mid-sized, state-supported university over three semesters. Students represent a variety of majors within the College of Business Administration. Majors include management, human resources, accounting, finance, and marketing. Most students were 21-22 years old, a majority were male, and most were seniors.

All students received two days of instruction on the rules of the Business Strategy Game. The BSG is widely used by students in strategy classes across the world. The main objective of the simulation is to manage a shoe company over a period of ten decisions. Three to four students compose a company. Students self-select their own groups. Once the company has formed, students make strategic decisions about all aspects of

the firm including finance, marketing, production, and human resources. As part of the simulation, students can decide to build and/or sell shoes in North America, Asia, and Europe. Typically, four separate "industries" are created in any given semester to accommodate student throughput in the classes.

In addition, students were invited to participate in a shadow stock market competition. Each was assigned a cash account of $10,000 with which to purchase shares of any company in any of the BSG industries running that semester – including their own. Students are limited to no more than three stock transactions per decision-year. The mechanics of the stock market are kept as simple as possible (i.e., no purchases on margin, no shorting, no restrictions on insider trading, etc.). After each decision-year, student portfolios are updated with current stock values and posted to the course's website along with updated industry and competitive information on all the simulated industries.

QUESTIONNAIRE

After two trial simulation runs, self-administered questionnaires were given to each of the students in the strategy classes. To date, we have achieved approximately an 87% overall return rate. Even accounting for missing questionnaires, the sample appeared to be quite representative of students in the capstone course.

The survey elicited student attitudes toward a variety of factors. Section one measured locus of control. There were nineteen questions. Respondents chose between two alternatives, selecting the alternative that came closest to their attitude. The locus of control scale was similar, but not identical, to the original locus of control scale developed by Julian Rotter (Whetten & Cameron, 1995).

Section two measured the student's tolerance of ambiguity. Based on a scale developed by Budner (1962), students indicated the extent to which they agreed to fourteen questions. The Likert-style, seven-point scale ranging from 7=strongly agree to 1=strongly disagree.

Section three focused on individual goal orientations. Students indicated on a four point Likert-style scale (1=not important to 4=very important) how important they felt certain factors were important to managing a business. There were seventeen items. Examples of the factors included: "keeping a large cash balance", "reducing reject rates", "becoming a global presence", and "providing a high quality product to our customers". Statements were chosen because they represented all aspects of running a business and were among the decisions made by students during the simulation.

The next section solicited students' attitudes toward risk. Twenty statements required a "yes" or "no" response. Examples of the types of statements included: "I would take the risk of starting my own business rather than to work for someone else." "Thinking of investing in stocks does not excite me." "A less secure job with a large income is more to my liking than a more secure job with an average income."

A cosmopolitan orientation scale contained ten statements (Berger & Grimes, 1973). Students indicated how closely they agreed with the statements using a 5 point scale ranging from 1= strongly disagree to 5=strongly agree. The survey ends with a brief set of questions on the respondents' name, simulation company name, gender, age, and occupational status.

Company performance was determined after ten decisions were completed. Success was determined by a number of factors – return on equity, net profit, stock value, bond rating, capacity planning, market share, earnings per share, measures of quality, service and value.

DATA ANALYSIS

The data analysis is proceeding primarily through correlation analyses and multiple regression analysis. Confirmatory factor analysis is used to develop indices of individual goal orientations.

PRELIMINARY RESULTS

Analysis is continuing, with a final wave of data collection now underway. However we can report on some preliminary findings.

TEAM GOAL ORIENTATION AND TEAM PERFORMANCE

Before we examine how individual attitudes and goal orientations affected the performance of the group, we need to examine how the group performed and if there were any specific group orientations that were associated with success.

There was a wide variation in team performance among the thirty simulated companies. In each of the eight completed "industries" there were companies competing for dominant status and others struggling to remain solvent. There were four distinct approaches to the competition that drove company performance.

Those companies that emphasized a more *global approach* to the market, as indicated by the extent of global employment, were among the most successful of companies in the competition. Global companies were generally among the more profitable operations, and there was a significantly positive correlation between globalization and measures of market share and stock market performance. These companies ended the competition in generally good financial health. Interestingly, they were also the most successful at growing their total employment in the U.S., even though the U.S. represented a smaller proportion of their total global capacity.

This was in contrast to teams trying to pursue a more *domestic approach* to the competition, as indicated by the extent to which a company maintained a larger percentage of its total capacity in one geographic region. Domestic companies were among the least successful firms in the competition. Market share was significantly smaller, and there were also significantly negative correlations with total employment and worker compensation. These companies were also among the least successful at satisfying the demands of their investors.

A third approach to the market emphasized achieving *manufacturing efficiencies* as indicated by unit labor costs. These were the most productive firms. Firms achieving lower labor costs were significantly more profitable, and generally did a good job of satisfying investor demands, especially in building market value.

Finally, a fourth approach to the competition was suggested by firms with a *customer orientation*, as indicated by an index of

product value. This index was calculated as the product of the company's average global quality and service ratings, divided by the average price of their products. Correlations are significant only for market share, which were positively associated with product value. However, the direction of the coefficients suggests a generally positive relationship between higher product value and measures of profitability and stock performance. Although these were smaller operations in terms of employment, they ended the competition in generally good financial condition.

INDIVIDUAL GOAL ORIENTATIONS

To what extent were these team orientations to the competition associated with the competitive goal orientations of individual respondents? Preliminary factor analyses seem to suggest the emergence of six distinct factors or goal orientations.

Four of the factors appear to correspond with the performance drivers suggested above. There was clearly one factor associated with concerns for *global* operations, and a second associated strongly with *customer*-oriented concerns for quality, service, and affordability. A factor reflecting concern for maintaining *U.S. employment* also emerged; interestingly a lower concern for profitability was also associated with this factor. Manufacturing *efficiency* also emerged as the last factor to be extracted.

Two additional factors were identified; however both dealt less with concerns for excelling at the ***means*** towards company success and more with the final ***ends*** themselves. One of these factors was organized around concerns for *financial performance*. The other was characterized more by concerns reflecting *financial conservatism*, the desire to maintain a higher cash balance, lower debt, and more generous dividends.

THE EFFECT OF INDIVIDUAL GOAL ORIENTATION ON TEAM PERFORMANCE

To what extent is the goal orientation of an individual associated with the competitive direction taken by their team, and with the team's ultimate performance in the competition?

The data suggests that individuals with a more global orientation did have some success moving their teams in a more global direction. The proportion of U.S. manufacturing capacity is lower, and market share is higher. Moreover, it was these teams that were most associated with customer value.

Other patterns of correlations between the other individual goal orientations and the performance of their teams remain non-significant. Respondents with a concern for U.S. employment had no significant impact on the direction of their teams, nor did those with a concern for financial performance. Those with a concern for manufacturing efficiencies were associated with groups with higher market shares, but their groups did not enjoy higher productivity or lower labor costs.

However, there was a striking series of negative correlations between those respondents with a more conservative approach to finances and the performance of their teams. These teams were among the worst performing companies and paralleled, in many respects, the performance of teams emphasizing U.S. employment and operations. These individuals were associated with teams with the lowest profitability and credit ratings, the lowest market shares, and generally poor performance.

PERSONAL ORIENTATIONS

To what extent does one's personal orientation affect goal orientations? The correlations suggest a moderate but significant relationship between global orientations and an internal locus of control, and also with a more cosmopolitan orientation to the world. Somewhat surprisingly, there was a negative association with tolerance for ambiguity, and especially with the subscale for tolerance for insolvable problems, although not significantly so.

Those individuals most concerned with financial performance were also less tolerant of insolvable problems. However the remaining correlations between goal orientations and personal orientations were low and non-significant. Indeed, there were no significant correlations between tolerance for risk and any of the goal orientations.

THE EFFECT OF PERSONAL ORIENTATION ON TEAM PERFORMANCE

Is there then any correlation between personal orientation and the eventual performance of that team? Although risk tolerance has little correlation with any of the goal orientations, it proves to be powerfully associated with team performance. Risk tolerant individuals had a broadly positive effect on the performance of their teams, and regression analysis suggests that risk propensity is the personal orientation most closely linked with lower labor costs – one key performance driver. Also as hypothesized, individuals with an internal locus of control also appeared to be positive assets for their companies, as did individuals with a greater tolerance for novel situations. An internal locus of control appears in regression analysis to be the personal orientation most associated with the performance driver of global employment, although that link is a weak one.

More compelling is the indication that one of the individual goal orientations – financial conservatism – plays a major role in determining whether an individual's team will choose a domestic or global strategy. The least financially conservative individuals were on teams that pursued more global employment. The most conservative individuals were associated with teams that retained a more domestic focus, especially if those individuals also had a low tolerance for novel situations. Surprisingly, none of the other measures of personal orientation appeared to have any significant consequences for subsequent group performance.

THE EFFECT OF PARTICIPATION IN THE SHADOW STOCK MARKET

Most students participated in the shadow stock market competition, but less than a third could be considered "active traders" – those making portfolio adjustments more than three times during the semester. Active traders themselves had significantly higher risk tolerance, a more internal locus, and higher tolerance for ambiguity. They were also less financially conservative, and – not surprisingly – associated with teams with stronger performance.

However, there also seem to be some benefits for less active participants. Modest but significant relationships with better performance are suggested for teams with participants in the supplemental stock market activity, although not as strong as for teams with personal orientations in the predicted direction.

DISCUSSION

Clearly, students who are less risk averse and who had an internal locus of control are associated with successful teams, supporting hypotheses one and three. There is only partial support for hypothesis two that focused on a student's tolerance for ambiguity and company performance. There was no support for cosmopolitanism affecting company performance. Hypothesis five addressed goal orientations. It was hypothesized that students who focus on the ongoing company operations will have a more positive influence on companies than students who focus on the final results. This hypothesis was supported. Students who were willing to spend money and continuously improve their companies finished the simulation in a much stronger position than did their peers who remained more conservative and concentrated on having a cash balance at the end.

Participation in the shadow stock market exercise does seem to mitigate some of the worst consequences of risk aversion and external locus of control. There also appear to be lesser but real benefits for highly conservative decision makers. Perhaps most promising is that participants were less likely to be associated with groups that ended the business simulation with a "failing" company (i.e., either bankrupt or trading below asset value).

This research is exploratory. Some of our findings may be influenced by regional characteristics. Nevertheless, these findings raise a critical issue. Since some personal and goal orientations can adversely impact performance even for capable students, what can instructors do to help make simulations a more positive experience?

Since risk-averse students appear to be the most vulnerable to poor performance in the simulation and ultimately in the classroom, the shadow stock market was introduced to help those students reframe their business decisions. With a broader perspective on industrial and competitive conditions and a more immediate focus on the creation of stockholder value, the exercise appears to be one useful tool for increasing the learning potential in business simulations.

REFERENCES

Barney, J. (1997). *Gaining and sustaining competitive advantage*. Reading, MA: Addison-Wesley Publishing Company.

Berger, P.K. and A.J. Grimes (1973). "Cosmopolitan-Local: A factor analysis of the construct." *Administrative Science Quarterly*, 18, 223-235.

Boone, C., B. de Brabander and A. van Witteloostuijn (1996). "CEO locus of control and small firm performance: An integrative framework and empirical test." *The Journal of Management Studies*, 33, 5, 667-700.

Budner, S. (1962). "Intolerance of ambiguity as a personal variable." *Journal of Personality*, 30, 29-50.

Evans, J. R. and W.M. Lindsay (1996). *The management and control of quality*. Minneapolis, MN: West Publishing Company.

Gouldner, A. W. (1957). "Cosmopolitans and locals: Toward an analysis of latent social roles." *Administrative Science Quarterly*, 2, 281-306.

Kedia, B. L. and R.S. Bhagat (1988). "Cultural constraints on transfer of technology across nations: Implications for research in international and comparative management." *Academy of Management Review*, 13, 4, 559-571.

Lee, D.Y (1997). "The impact of poor performance on risk-taking attitudes: A longitudinal study with a PLS causal modeling approach." *Decision Sciences*, 28, 1, 59-80.

MacCrimmon, K. R. and D.A. Wehrung (1990). "Characteristics of Risk Taking Executives." *Management Science*, 36, 4, 422- 436.

Majer, C., B.A. Bailey, J. Censor and M. Bassin (1989). "How do you get managers to be risk takers?" *Training and Development Journal*, 43, 7,13-21.

Marks, L. (1988). "Deconstructing locus of control: Implications for practitioners." *Journal of Counseling and Development*, 76, 3, 251-260.

Rotter, J. B. (1990). "Internal versus external control of reinforcement: A case history of a variable." *American Psychologist*, 45, 489-493.

Schwenk, C. R., and I. Mitroff (1982). "Effects of inquiry methods and ambiguity tolerance on prediction performance/dialectic squared: A fundamental difference in perception on the meanings of some key concepts in social science." *Decision Sciences*, 13, 2 207-225.

Securities Industry and Financial Markets Association (2007). *The stock market game.* New York: Securities Industry Association.

Stone, R.A. (1995). "The business strategy game: Faculty experiences and student perceptions." *Journal of Management Education*, 19, 281-291.

Thompson, A. and G. Stappenbeck (1997). *The business strategy game: A global industry simulation.* Boston, MA: Irwin McGraw Hill.

Wharton, R., L. Parry and G. Buntzman (1999). "Success or bankruptcy: The relationship between personal and goal orientation and simulation performance." *ABSEL Proceedings*.

Whetton, D. and K.S. Cameron (1995). *Developing management skills*. New York: HarperCollins College Publishers.

Wood, W.C. and J.R. Geisen (1991). "Asset selection and trading strategy in stock market simulations." *Journal of Education for Business.* 66, 6, 374-376.

Wright, T. A. and L. Larwood (1997). "Further examination of the cosmopolitan-local latent role construct." *Psychological Reports*, 81, 3, 897-898.

Wood, W. C., S.L. O'Hare and R.L. Andrews (1990). "How to 'win' the stock market game." Paper presented at the *1990 American Economic Association Meetings*, Washington, DC. James Madison University, Harrisonburg, V.