FOLLOW THE LEADER II

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ABSTRACT

This study extends, in two important ways, the seminal work done by Markulis and Strang (2012) on the extent and implications of students using "follow-the-leader"(FtL) strategies in business simulations. First, a series of in-depth interviews are conducted with student teams who actually play a simulation. The interviews are meant to ascertain the student team rationale for choosing a particular strategy. Second, this study investigates the possible use of the FtL strategy using simulations based upon the model of monopolistic competition; whereas the prior study was limited to oligopoly market simulations. In the market of monopolistic competition, there are many competitors, and the influence of any one firm is small. Because of this, the FtL strategy is hypothesized to be less prevalent than in the oligopoly market simulations. Nonetheless, an interesting finding is that students in an oligopolistic simulation often report that they are not using the FtL strategy, when the data suggest they are. Both the survey results and the analysis of more competitive market environments yielded some other important differences and insights regarding FtL behavior in business simulations.

INTRODUCTION

In 2012, Markulis and Strang published the results of their preliminary study of the existence of FtL (follow the leader) behavior on the part of players of a generalized business enterprise simulation. In their study they focused on player behavior in terms of two marketing decisions made by participants of the simulation. With respect to price, they defined it as FtL behavior if a player (usually a student team) that was not in first place during a period of play modified its price decision from the previous period of play such that it moved closer to the price of the industry leader for the previous period. They tracked the price decisions for seven different class sections over the course of several academic years and for several periods of simulation play. They concluded that FtL behavior was observed for slightly more than 50% of all of the price decision by trailing teams. They similarly found that in more than 50% of the promotion decisions by trailing teams the teams displayed FtL behavior. Markulis and Strang (2012) readily conceded their database was small and their research was limited to the use of one simulation, and concluded that they intended their work to serve as a preliminary study designed to stimulate interest in exploring the existence of the FtL phenomenon in game play. This paper extends the initial research both in terms of scope and economic theory.

LITERATURE REVIEW

In their paper in 2012, Markulis and Strang present a review of the relevant literature relating to the possible existence of FtL strategies on the part of players of business simulations. Since their review is readily available it would be redundant to replicate that review here. Nonetheless, some background information is necessary. The following table briefly summarizes (with appropriate references) the key points of their review.

Except for Goosen's work in 2008 and in 2009, and Markulis and Strang's work in 2012, most of the observations made about the existence of a FtL phenomenon were anecdotal observations made by game administrators whose primary focus was not on FtL behavior. Goosen's work was speculative as opposed to empirically based.

The authors' intention for this paper is to extend the research two ways. First, the authors extend the empirical work through a series of in-depth interviews with student teams who are actually playing the simulation. The interviews are meant to ascertain the student team rationale for choosing a particular strategy and to compare the interviews with the team's actual simulation decisions. Second, this study investigates the possible use of the FtL strategy using simulations based upon the model of monopolistic competition. Markulis and Strang's FtL analysis was conducted using a simulation and game environment based upon the oligopolistic model. In the oligopolistic model there are few competitors and economic theory predicts that firms will be very cognizant of the marketing strategies of their competitors. In the

market of monopolistic competition there are many competitors, and the influence of any one firm is small. Because of this, the FtL strategy is hypothesized to be less prevalent than in the oligopoly market simulations.

METHODOLOGY TO EXPLORE ATTITUDE

Participants. Student teams from two sections of a strategy course using the DECIDE Simulation were used to conduct the research. The first section of the course had 24 students, which comprised 6 teams of 4 students on each team, while section 2 had 20 students which comprised 5 teams of 4 students on each team. It should be noted that the instructor gave a one class overview of the simulation emphasizing the importance of key marketing, finance and production factors, particularly at the beginning of the simulation. There were two practice rounds so students could become familiar with the simulation and its mechanics. The instructor **did not** mention the FtL strategy, but did point out to students that they were in an environment that economists call an **oligopoly**. All of the students in the course had taken at least an introductory microeconomics as a prerequisite course and as a consequence have had some knowledge of oligopolistic behavior as well as the implications of that behavior environment on a firm's price strategy.

Teams were told by the instructor that they would be interviewed after each decision period by a group of students unassociated with the simulation for purposes of research and that the interviews would not be viewed by the instructor and would not affect their grade on the simulation nor on the course as a whole. This was to help ensure genuine and unbiased responses. Student teams were also told that it was a sine qua non for them to participate in the interview process and the interviewing team would keep track of who participated and who did not.

Interview Questions. There were 7 rounds of play for the simulation. The following interview questions were asked after the first, second, fourth and final rounds of play. Some of the questions were intentionally redundant.

1. Did your team have an initial first round (or total game) strategy? If so, explain?
2. If you did not have a first round (or game) strategy, what are you going to use to make your next round of decisions?
3. If you have a strategy, could you describe it?
4. Did you start in first place? If so, why do you think you started there? If not, what was your initial ranking and why do you think you started there?
5. If you did not start in first place, but are now there, how do you think you got there now?
6. Do you think other teams will try to imitate your moves? Why?
7. Is there someone on the team who takes the lead in what the next round's decision will be?
8. Did you look at any other team's numbers (decisions)? In other words, did you buy any information?
9. Just because a team is in first place, did your team think they made good decisions?
10. If your team was not initially in first place, did you look at the first place team's decisions? If so, what influence—if any—did this have on your decisions for the next round?
11. In making your next round of decisions, are you thinking that it might be best simply to do what you are doing, or change—why (for either position)?

One of the goals of this research was determine the perception of student players as to what strategy they believed they were using in they the DECIDE simulation (categorized as an oligopolistic environment) and if that strategy was an explicit or tacit FtL strategy. The in-depth interviews amounted to about 28 pages of text. These interviews were culled to compile information germane to this research. The results are summarized in table 2.

Table 2 contains 4 categories:

- initial rank;
- round or period of play rank;
- perceived strategy, and;
- perceived use of FtL.

Column 3, the perceived strategy is a summary of what the team said their strategy was for that particular round of play and is based primarily on the team responses to questions 1, 2 and 3. The FtL determination, column 4, is based principally on the teams' responses to interview questions 8 and 10, which ask somewhat obliquely, whether they looked at price (and other) information and if and how they might have used this information. The ranking for each team for the periods that were selected is presented in Table 3.

Table 1
Summary of articles dealing with FtL (copycat) strategies

Authors and reference	Key Points
Green & Faria (1995)	Many simulation administrators have witnessed the use of "copycat" strategies.
Patz (2001)	Dominant teams...have established and maintained an early lead.
Goosen (2009, 2008)	Goosen looked at FtL behavior with respect to price in 2008 and, with respect to advertising in 2009. The follow the leader strategy theoretically has been proven in this study and also in the previous (2008) study
Goosen (2009)	The theory (FtL)...needs to be tested.
Michlich (2007)	FtL is one of several strategy choices
Wellington, et al. (2008)	Refers to the tendency of teams in simulation play is to employ a FtL strategy

Table 2
Team Strategy and Use of FtL for Section 1(Based on Interviews)

T#	INITIAL ROUND	2nd ROUND	2nd R	4th ROUND	4th R	FINAL ROUND	F R
	Initial strategy	***Strategy***	***FtL***	***Strategy***	***FtL***	***Strategy***	***FtL***
1	Allocate lots of $ to R&D, trick other teams in thinking we had an aggressive strategy, expand gradually	Stay the course	Didn't look	Thought about changing—not sure to what	Looked but did not FtL	Deviated from initial course—did better when return to initial strategy—bit too late	Not sure if FtL would have made a difference
2	Game seemed to be based on efficiency so focus on that	No specific strategy. Hard to figure out what to do as teams seemed to have changed from their practice round strategies.	Did not look	Still focus on POM. We are doing much better	Response ambiguous	Kept screwing up ordering and moving from stockouts to excess inventory with huge capacity	Did not pay attention to 1st place team's Strategy
3	Marketing and Promotion—watch the actions of others	Improve Production as we screwed up ordering process. Try to use price to fix problem	Looked at price leader but did not use FtL	Tried to mimic 1st place team as nothing lese working	FtL	Tried several approaches—nothing seemed to work. Should have stuck to one strategy	Since we were mostly in 1st place—did pay attention to others
4	R & D, maintenance and slow capital investment	Lower downtime & stockouts.	Looked at price leader but did not FtL except for R&D	Work on POM—still having trouble managing inventory	Did not use FtL	Finally got POM going well with slow growth—helped at the end	Did not see how FtL would have helped
5	Slow growth, making sure POM was well managed	same	Looked but did not consider important	Try to stay close to 1st place team and make a significant move on price right at the end	FtL	Tried several approaches, but too late to see results	Looked at price leader but did not FtL
6	Slow growth, focus on consistency. Felt public would view radical changes badly	Stay the same	Looked at price leader but did not FtL	Do nothing radical—steady growth	Looked at price leader but did not FtL	Thought about copying but didn't. Felt slow but steady growth paid off	Looked at price leader but did not FtL

RESULTS AND DISCUSSION OF INTERVIEWS

Section 1 Results: As can be seen from Table 2, many teams focused on a slow growth strategy emphasizing production, and R&D, with one team stating their strategy as marketing/price oriented. As the rounds progressed, some teams changed but not radically so. Surprisingly, several teams had trouble with inventory management, despite the fact that they should have understood these concepts from the practice rounds, reading the manual, or instructor's initial comments. What is most surprising though is that few teams claimed to use a FtL strategy. The question is: Should this claim be taken seriously? To assess this, the authors examine two actual simulation decisions made by the teams: (1) the actual price decision and, (2) the decision to purchase competitive information. Table 3 presents the price movement information, while Table 4 lists the competitive information teams purchased during the periods of play in question.

After the first round of play, none of the five trailing teams had adopted a FtL strategy. In the fourth period of play, no teams adopted a FtL strategy; three teams adopted a status quo decision (they did not change their price from the previous round), one team set a price in the direction of the industry leader, but overshot the mark; and two teams set prices away from the industry leader. In the last period of play, two teams set prices away from the price leader's price, while two teams kept their prices the same and one

Table 3
Price Strategies for Section 1 for periods 1, 2, 4, and 7

Teams	Rank after per. 1	Price top team	Price each team Period 1	Price each team Period 2	Behavior	Legend for behaviors:
1	2		30.00	30.00	S	
2	1	29.50	29.50	29.65	NA	F = follow the leader's price
3	5		29.99	32.00	A	T = move toward & beyond leader's price
4	3		27.90	27.95	T	S = status quo (i.e. no change in price)
5	4		29.99	30.29	A	A = set a price away from leader's price
6	6		30.50	30.00	T	NA = not applicable since industry leader

Teams	Rank after per. 2	Price top team	Price each team Period 2	Price each team Period 3	Behavior
1	1	30.00	30.00	30.00	NA
2	5		29.65	29.25	A
3	6		32.00	29.00	T
4	2		27.95	28.50	F
5	3		30.29	30.49	A
6	4		30.00	30.00	S

Teams	Rank after per. 3	Price top team	Price each team Period 3	Price each team Period 4	Behavior
1	2		30.00	30.00	S
2	5		29.25	29.99	A
3	6		29.00	29.00	S
4	1	28.50	28.50	29.95	NA
5	3		30.49	30.54	A
6	4		30.00	30.00	S

Teams	Rank after per. 6	Price top team	Price each team Period 6	Price each team Period 7	Behavior
1	3		29.50	35.00	T
2	5		34.00	36.00	A
3	6		29.00	29.00	S
4	1	29.95	29.95	30.50	NA
5	4		30.75	31.15	A
6	2		32.00	32.00	S

team did move toward the price leader's price. Thus, over several periods of play, only 1 team moved its price toward the price leader, which can be construed as pursuing a FtL strategy. These results are much different than those reported in the Markulis and Strang study which reported FtL behavior for about ½ of all price decisions (2012).

The DECIDE simulation has a provision that players can purchase either the industry **mean** for: (1) price, (2) promotion, (3) R& D, and/or (4) sales for a particular period of play or they can purchase the specific value for (1) price, (2) promotion, (3) R & D, and/or (4) sales units for **all** of the firms in the industry.

Looking at the expenditures by teams to buy information about their competitors in Table 3, it seems that teams spent more money and ordered more information about their competitors in the earlier rounds than in the later rounds, suggesting that they did indeed look at their competitors' decisions. All 6 teams ordered some type of information for both round 1 and round 2, while 4 teams ordered information for round 4 and only 2 teams ordered information for round 7. Our suspicion is that students who purchased information about their competitors looked at it, but were not sure how to use it or if FtL was a good strategy. Further, teams often purchased mean information (i.e., the mean value for all the competitors in the industry for the item of interest). It is interesting that teams purchased mean information of various types 12 times in 4 rounds of play as opposed to complete (which is denoted as ALL) information 34 times in 4 rounds of play, leaving one to wonder how they intended to use this information. Mean information, for example, would not indicate anything about the spread of pricing, nor would it tell one what the first place team's price was. It would seem that even if teams viewed price information, most of them did not use a FtL to move toward the first place team. This is fairly consistent with their interview responses.

It should be noted that teams were not told when the final round would occur. Further, looking at Table 3, team 2 moved from first place to last place while team 6 went from last place to first place over the course of 7 rounds of simulation play, while all the other teams moved slightly up or down in ranking through the simulation. This is generally not typical of how teams perform in this (and one presumes) in other similar simulations. Thus, one is not sure how to assess the reliability or consistency of these results.

Section 2 Results: Section 2 had 5 teams. As can be seen from Table 5, most teams focused on production and R & D decisions in the earlier rounds and adjusted those same strategic objectives as the simulation progressed.

In terms of FtL, most of the teams said they looked at their competitor's price decisions but did not use them to guide their own strategic decisions. One team openly admitted that they were not sure how to use such information, although one suspects that this was true for others as well. Some teams admitted that they paid attention to the first place team's figures and some teams said that they tried to stay close to those figure, but not in every round. Again, one needs to ask if the student team claims should be taken as authentic. For that, the authors examined both price change information (Table 6) and purchase of competitor information (Table 7).

For example, looking at Table 6, it is interesting that the results for section 2 were different in terms of FtL behavior from those observed in section 1. In the first two periods of play, 2 of the 4 price decisions made by trailing teams were FtL decisions; one decision was toward, but beyond the industry leader; and 1 decision represented a price decision away from the industry leader. In period 4, three teams maintained the same price they had for the previous period and two teams moved their price away from the price leader's price. In the last period, (7^{th}), two teams moved their prices toward the price leader's price while two teams kept their price the same as was in the previous period. So, in section 2, the percentage of teams which adopted a FtL is close to 50% and in line with the results reported by Markulis and Strang (2012).

Looking at the purchases of competitors information in Section 2 (see Table 7), what is immediately striking is that the last place team at the end of the simulation had purchased the most information through the rounds of play. One is cautioned about the significance of these results especially since the first place team was second in terms of

Table 4
Team rank and purchase of competitive information for selected rounds for Section 1

T #	1st	1st Information	2nd	2nd Information	4th	4th Inform.	7th (Final)	7th Inform.
1	2	PrM, PM, R/DA, SA	1	PrM, PA, R/DA, SA	2	PM, R/DA, SM	4	PrA, R/DM, SA
2	1	PrA, PM, R/DM, SA	5	PrA, PM, R/DM, SA	5	None	6	None
3	5	R/DA, SA	6	R/DA, SA	6	PrA, SA	5	PrA, SA
4	3	PrA, PM, R/DA, SA	2	PrA, PA, R/DA, SA	1	None	2	None
5	4	PrA, PA, R/DA	3	PrA, PA, R/DA	3	PrA, SA	3	None
6	6	PrA, PA, R/DA, SA	4	PrA, PA, R/DA, SA	4	None	1	None

KEY: PrA = Price All, PrM = Price Mean, PM = Promotion Mean, PA = Promotion All, etc.

Table 5
Team Strategy and Use of Ft for Section 2 (Based on Interviews)

T#	Initial Round	2nd Round	2nd Round	4th Round	4th Round	Final Round	Final Round
	Initial strategy	Strategy	FtL	Strategy	FtL	Strategy	FtL
1	Focus on increasing prod. Then work on promotion and R&D in future rounds	Continue to work on Prod.	Not yet, but we intend to buy and review all competitor info next round	Initial strategy with refinements—doing well	We keep an eye on all competitive information. Will adjust some factors if necessary. Only bought mean info.	Our initial strategy seemed to work well. Felt most teams did know what to do	Only bought mean promotion info.
2	Low price, high volume, high Promo. Pile up inventory for future use. Carry over cost would be justified in future	Focused on factors which we felt could not be copied—like production	We only looked at sales	Stuck with initial strategy	Bought mean price information.	Looked top firms and tried to imitate, but slightly lower price	Looked at price and sales
3	Conservative strategy slowly increase promotion, R&D	Stay the course, but fine tune based on what others are doing	Yes, we looked but did not necessarily imitate leader	Get more conservative but increase R&D	No—top teams could just be lucky	Tried to be efficient, grow slowly and invest in R&D	Looked at Promotion and price and tried to stay close, sometimes lower—sometimes higher
4	Set lowest price and work on reducing waste	We hope to make a drastic change (not sure what) near end to reach the top—or close to it	Looked by not sure how to use	Focus more on R&D and promotion.	Yes, somewhat—we looked mostly at price, but did necessarily change ours because of theirs.	Kept tinkering with price and promotion after basic strategy was set	no
5	Change from practice rounds—have lowest price and high levels of Promo and R&D	Invest in R&D—will pay off later	Looked but not sure that 1st place team made best decisions	Focus more on lowering price, but watch to see what others are doing with price	Yes—watch price information and keep our as one of the lowest	Thinking of mimicking first place team but game ended	Yes, looked at Price and Promotion and tried to stay close

Table 6
Price Strategies for Section 2 for periods 1, 2, 4, and 7

Teams	Rank after per. 1	Price top team	Price each team Period 1	Price each team Period 2	Behavior	Legend for behaviors:
1	1	27.00	27.00	27.00	NA	
2	2		26.97	27.92	T	F = follow the leader's price
3	3		26.00	25.00	A	T = move toward & beyond leader's price
4	4		26.00	27.00	F	S = status quo (i.e. no change in price)
5	5		30.50	29.50	F	A = set a price away from leader's price
						NA = not applicable since industry leader

Teams	Rank after per. 2	Price top team	Price each team Period 2	Price each team Period 3	Behavior
1	3		27.00	29.00	T
2	1	27.92	27.92	28.43	NA
3	2		25.00	25.50	F
4	4		27.00	28.00	F
5	5		29.50	30.25	A

Teams	Rank after per. 3	Price top team	Price each team Period 3	Price each team Period 4	Behavior
1	2		29.00	30.50	A
2	1	28.43	28.43	30.95	NA
3	5		25.50	26.00	F
4	4		28.00	29.00	T
5	3		30.25	31.50	A

Teams	Rank after per. 6	Price top team	Price each team Period 6	Price each team Period 7	Behavior
1	1	30.50	30.50	30.50	NA
2	3		35.35	28.50	T
3	5		30.50	36.00	A
4	2		34.11	35.07	A
5	4		36.00	36.00	S

Table 7
Team rank and purchase of competitive information for selected rounds for Section 2

T #	1st	1st Information	2nd	2nd Information	4th	4th Inform.	7th (Final)	7th Inform.
1	1	none	3	PA, R/DA, PrM, SA	2	PA, R/DA, PrM, SA	1	PrM
2	2	SA	1	PA, PrA, R/DA, SA	1	PA, R/DA	3	PA, PrM
3	3	PA, SA	2	RPA, PrA, R/DA	5	PA, PrA, R/ DA, SA	5	PA, PrA
4	4	PA, SA	4	PA	4	PA, PrM	2	PA, PrM
5	5	none	5	none	3	none	4	PA, PrM

KEY: PrA = Price All, PrM = Price Mean, PM = Promotion Mean, PA = Promotion All, etc.

expenditures on competitive information throughout the rounds of the simulation. The last place team purchased the least amount of information through the simulation and most teams did not purchase mean information except near the end of the simulation. For the most part, it seems as though teams were inconsistent and disjointed in their purchase of competitive information as well as in their use of FtL.

METHODOLOGY TO EXPLORE THE IMPACT OF MARKET STRUCTURE

In order to determine the impact of market structure (i.e., oligopoly or monopolistic competition) on the tendency to adopt a FtL strategy, the authors replicated the methodology employed by Markulis and Strang (2012) but with a significant difference in that they used the *Beat the Market* simulation written by Gold (2007) instead of the *DECIDE* simulation written by Pray and Strang (1980). *Beat the Market* was selected because it was designed so that a monopolistically competitive environment could be set as the underlying environment. *DECIDE* was designed to be used in an oligopolistic environment.

In the Markulis study seven different plays of the game were examined. The plays were designated as plays A, B, C, D, E, F, and G. The number of teams competing in the seven different plays of the game ranged from a low of 5 teams to a high of 7 teams. These numbers are consistent with the numbers dictated by oligopoly theory. In this current study four different plays (i.e. different class sections) were tracked. The game plays are designated J, K, L, and M. In game play J there were 19 teams, in game play K there were 19 teams, in game play L there were 15 teams and in game play M there were 13 teams. These numbers are consistent with the model of monopolistic competition, but exceed those that one would typically find in an environment that one would describe as an oligopoly.

As in Markulis' study, the price of all of those except the industry leader was recorded for each game play for two transitional periods (i.e. from period 1 to 2 and from period 2 to 3). The results for Game Plays J, K, L and M are presented in Tables 8 through 11, respectively.

In Table 8, Game Play J, 6% of the decisions conform to a FtL strategy for period 1 to 2. The percentage of FtL decisions for plays K, L, and M (Tables 9 to 11) are 33%, 29%, and 25%. It is notable that these FtL percentages are generally lower than the comparable numbers reported in the Markulis study. The comparable numbers for that study are 83%, 75%, 50%, 62.5%, 30%, 20%, and 71%. So, the notable result is a significantly less pronounced tendency of trailing teams to adopt a FtL strategy in the monopolistically competitive game environment than in an environment of oligopolistic competition.

Focusing on the more aggregated numbers for periods 2 to 3, for all 7 game plays the percentage of teams that could be categorized as adopting the FtL strategy in the oligopoly environment (Markulis and Strang 2012 study) was 51%. The comparable number in an environment of monopolistic competition, found in this study is 23% (see Table 12).

A similar analysis was done with respect to promotion and is summarized in Table 13. Classic economic theory argues that price competition is avoided in oligopoly markets owing to fears of price wars as described by the kinked demand theory. As a consequence, economic theory argues that non-price competition is more pronounced in oligopoly markets with more differentiated products than in monopolistic competition markets. In the current study, Table 13 reports between 13% and 17% of the game players displayed FtL behavior. In contrast, Markulis and Strang (2012) found 53% displayed FtL strategies with respect to promotion, which is significantly higher than in the monopolistic competition game environment. It is refreshing that the empirical results from these two studies seem to support what economics professors have been teaching in their classrooms for many years; i.e., non-price competition is more pronounced in oligopoly markets.

RESULTS AND DISCUSSION OF MARKET STRUCTURE ANALYSIS

In general, teams were more likely to adopt a FtL strategy in terms of price when playing in the environment of an oligopoly than in the environment of monopolistic competition, at least for the most part. Yet, many of these same teams which were using the *DECIDE* simulation did self-report that they did not use a FtL strategy. If game administrators are concerned about the learning that may be occurring if participants playing simulations simply adopt a FtL price strategy, these results may be significant in terms of the simulation selection. *DECIDE* was developed to be used in an environment of oligopoly, while *Beat the Market* was designed to facilitate an environment of monopolistic competition. So, if game administrators are troubled about teams simply adopting an FtL price strategy, they may to be mindful of the underlying market structure supported by the simulation they choose.

The results from the Markulis and Strang (2012) study and this study generally support that student players, either based upon knowledge, experience or instinct, perform in a way that is consistent with the predictions of the economic theory of market behavior. Classic economic theory suggests that firms in an environment of oligopoly will focus more of their attention on their rivals as compared to monopolistic competition. Further oligopoly theory suggests a behavior of matching decreases in rival prices, as well as realizing the importance of actively seeking venues other than price in which to compete. Firms in monopolistic competition will be far less focused on rival strategies and play closer attention to overall market conditions. Both of these market behaviors were found to occur in this study.

One might expect that sometime over the course of ABSEL's 40 years of critical self-analysis at least one published study would provide some useful information about the simulations being used in terms of the underlying economic market structure that they model. Regrettably, that doesn't seem to be the case. A careful review of all ABSEL materials from its advent until now indicates that the work of Keys and Biggs (1990) is likely the most useful in terms of a taxonomy of game characteristics for the simulations that were used in that era. But referring to the

Table 8
Price Behavior Game Play J

Price Decisions for Quarters 1 and 2

Firm	Ranking at end Q1	Price of first place at Q1	Firm Price at Q1	Firm Price at Q2	Behavior
1	16		$77.10	$79.40	F
2	9		$80.00	$80.00	S
3	14		$78.99	$78.90	A
4	3		$79.75	$78.30	A
5	5		$79.70	$79.70	S
6	6		$79.81	$77.48	A
7	12		$79.00	$79.00	S
8	1	$80.44	$80.44	$77.00	NA
9	18		$78.14	$78.14	S
10	8		$78.91	$78.91	S
11	4		$79.68	$78.10	A
12	7		$80.00	$76.50	A
13	10		$80.83	$80.00	T
14	15		$86.00	$74.00	T
15	2		$80.44	$78.00	A
16	13		$79.30	$78.20	A
17	11		$80.00	$78.50	A
18	19		$81.00	$82.00	A
19	17		$76.61	$82.42	T

Legend for behaviors:

F = follow the leader's price

T = move toward and beyond leader's price

S = status quo (i.e. no change in price)

A = set a price away from leader's price

NA = not applicable since industry leader

Price Decisions for Quarters 2 and 3

Firm	Ranking at end Q2	Price of first place at Q2	Firm Price at Q2	Firm Price at Q3	Behavior
1	16		$79.40	$75.80	T
2	14		$80.00	$74.00	T
3	8		$78.90	$75.00	T
4	7		$78.30	$74.30	T
5	9		$79.70	$74.60	T
6	12		$77.48	$73.20	T
7	5		$79.00	$76.00	T
8	10		$77.00	$74.50	T
9	15		$78.14	$70.33	T
10	6		$78.91	$75.00	T
11	4		$78.10	$74.20	T
12	1	$76.50	$76.50	$72.50	NA
13	18		$80.00	$75.00	T
14	13		$74.00	$72.50	A
15	2		$78.00	$74.60	T
16	3		$78.20	$73.80	T
17	11		$78.50	$73.00	T
18	19		$82.00	$77.00	F
19	17		$82.42	$72.92	T

Table 9
Price Behavior Game Play K

Quarters 1 and 2

Firm	Ranking at end Q1	Price of first place at Q1	Firm Price at Q1	Firm Price at Q2	Behavior
1	17		$72.00	$79.50	F
2	4		$78.21	$76.77	A
3	8		$77.50	$76.00	A
4	9		$78.12	$81.12	T
5	7		$77.90	$75.00	A
6	10		$76.50	$78.00	F
7	2		$79.00	$77.32	A
8	5		$78.80	$78.90	F
9	3		$78.90	$78.11	A
10	16		$73.20	$76.00	F
11	18		$89.84	$89.84	S
12	13		$74.86	$74.86	S
13	15		$78.86	$78.86	S
14	6		$78.17	$76.15	A
15	19		$79.86	$77.86	A
16	12		$76.00	$77.00	F
17	1	$81.00	$81.00	$77.70	NA
18	14		$75.86	$82.92	T
19	11		$76.25	$81.00	F

Legend for behaviors:

F = follow the leader's price

T = move toward and beyond leader's price

S = status quo (i.e. no change in price)

A = set a price away from leader's price

NA = not applicable since industry leader

Quarters 2 and 3

Firm	Ranking at end Q2	Price of first place at Q2	Firm Price at Q2	Firm Price at Q3	Behavior
1	13		$79.50	$78.00	T
2	5		$76.77	$76.23	A
3	7		$76.00	$75.00	A
4	14		$81.12	$78.00	T
5	16		$75.00	$78.00	F
6	12		$78.00	$76.80	A
7	4		$77.32	$76.40	A
8	3		$78.90	$76.50	T
9	1	$78.11	$78.11	$76.55	NA
10	6		$76.00	$76.23	F
11	18		$89.84	$82.00	F
12	15		$74.86	$75.11	F
13	17		$78.86	$82.96	A
14	8		$76.15	$72.30	A
15	19		$77.86	$77.86	S
16	11		$77.00	$77.30	F
17	2		$77.70	$77.40	A
18	9		$82.92	$75.92	T
19	10		$81.00	$79.50	F

Table 10
Price Behavior Game Play L

Price Decision for Quarter 1 and 2

Firm	Ranking at end Q1	Price of first place at Q1	Firm Price at Q1	Firm Price at Q2	Behavior
1	4		$77.50	$76.50	A
2	15		$78.00	$78.99	T
3	1	$78.25	$78.25	$78.36	NA
4	14		$75.15	$75.20	F
5	12		$75.50	$78.00	F
6	11		$76.00	$78.00	F
7	7		$78.50	$78.80	A
8	2		$78.00	$77.25	A
9	10		$77.00	$76.50	A
10	13		$76.50	$77.50	F
11	6		$77.24	$76.30	A
12	8		$77.17	$72.52	A
13	5		$77.57	$74.56	A
14	3		$77.63	$74.72	A
15	9		$77.10	$74.36	A

Legend for behaviors:

F = follow the leader's price

T = move toward and beyond leader's price

S = status quo (i.e. no change in price)

A = set a price away from leader's price

NA = not applicable since industry leader

Price Decision for Quarter 2 and 3

Firm	Ranking at end Q2	Price of first place at Q2	Firm Price at Q2	Firm Price at Q3	Behavior
1	7		$76.50	$74.00	T
2	11		$78.99	$76.70	F
3	14		$78.36	$74.65	T
4	9		$75.20	$74.50	T
5	13		$78.00	$74.00	T
6	12		$78.00	$74.50	T
7	15		$78.80	$74.50	T
8	6		$77.25	$73.00	T
9	10		$76.50	$76.00	F
10	8		$77.50	$75.00	F
11	4		$76.30	$72.00	T
12	3		$72.52	$69.93	A
13	2		$74.56	$72.87	A
14	1	$74.72	$74.72	$69.85	NA
15	5		$74.36	$70.12	A

work of Keys and Biggs presents two problems: (a) it was published in 1990 (i.e. 22 years ago); and (b) it did not explicitly address the underlying market structure modeled by the simulations that they included in their taxonomy. So, without research-based empirical data, we are left to anecdotal conjecture. Permitting us to offer a conjecture, it is logical to conclude by the nature of their evolution and typical use in contemporary business classrooms, that most of the widely-used generalized business simulations create an environment that mimics the classical economic market structure of **oligopoly**. This inference presumes that many (most) of the traditionally used generalized business simulations are used in a class of roughly 30 to 35 students in which up to 8 teams are created to play the simulation. This model clearly places the game participants in an environment that economists would label as oligopoly. Although it is problematic to determine how many class setups follow this pattern, it is for those classes that a concern for "mindless" FtL behavior might be an issue, as shown by the interview analysis.

CONCLUSIONS

Several interesting conclusions can be drawn from this study.

- First, the disparity in the results for the two sections playing the *DECIDE* simulation is perplexing. It is quite unusual for the first place team to end up in last place and the team starting in last place to arrive in first place. It may be appropriate to view the behavior of the

Table 11
Price Behavior Game Play M

Quarters 1 and 2

Firm	Ranking at end Q1	Price of first place at Q1	Firm Price at Q1	Firm Price at Q2	Behavior
1	3		$82.00	$83.50	A
2	8		$75.62	$76.62	F
3	4		$78.90	$78.70	A
4	5		$81.70	$81.70	S
5	12		$81.00	$81.50	A
6	6		$80.00	$81.00	A
7	7		$79.25	$79.25	S
8	2		$80.50	$82.00	A
9	13		$72.50	$75.00	F
10	10		$82.25	$81.25	A
11	1	$79.63	$79.63	$80.00	NA
12	11		$76.00	$80.00	T
13	9		$77.62	$78.50	F

Legend for behaviors:

F = follow the leader's price

T = move toward and beyond leader's price

S = status quo (i.e. no change in price)

A = set a price away from leader's price

NA = not applicable since industry leader

Quarters 2 and 3

Firm	Ranking at end Q2	Price of first place at Q2	Firm Price at Q2	Firm Price at Q3	Behavior
1	6		$83.50	$79.50	F
2	1	$76.62	$76.62	$77.62	NA
3	13		$78.70	$78.70	S
4	7		$81.70	$81.90	A
5	3		$81.50	$82.50	A
6	12		$81.00	$79.00	F
7	10		$79.25	$76.25	T
8	4		$82.00	$77.00	F
9	9		$75.00	$73.50	A
10	2		$81.25	$82.25	A
11	8		$80.00	$80.00	S
12	5		$80.00	$80.00	S
13	11		$78.50	$78.25	F

teams in section 1 as an outlier. Unfortunately, the authors do not have enough historical data from this or other simulations to determine if this is the case. Further investigation is necessary to see if this is the case and, if it is, how often.

- A second, perhaps troubling point, concerns the teams' self-reports regarding FtL usage. Many teams reported that they did not use FtL, but at least in Section 2, those same teams either used a tacit FtL strategy or purchased information about their competitors suggesting they if they looked at such information--they used it. One wonders why students would report that they did not use the FtL approach. A good guess may be that students did not understand that they were in an oligopolistic environment and that a good strategic choice was the FtL. Perhaps teams believed that if they reported using a FtL, it would signify that they did not know what else to do!

The second conclusion leads directly to a third consideration. Instructors should understand the underlying economic model of the simulation they use and give some thought as to whether and/or how much explanation they give to the students about that model. Failure on the part of the professor to do so, according to the results of this study, lead to greater frequency of FtL behavior on the part of the students, if they are placed in an environment that simulates oligopoly. One wonders, if the instructors were to thoroughly explain optimal strategies for an oligopolistic simulation—or any model--would students make better (more informed) decisions?

With that said, the results from this study must be viewed in perspective. Although this work was an extension of the work by Markulis and Strang (2012), there are a number of limitations of this study that the authors openly acknowledge. In regards to the oligopoly-based simulation, the study looked at two class sections over a short period of time. Interviews were conducted by nonprofessionals and could have over-simplified some of the student reports. Some types of bias also may have been present.

Nonetheless, what seems clear: (a) students are often guessing in terms of their strategic decisions; (b) many students are using a tacit FtL strategy, while stating that they are not using it; (c) students are not sure how to use purchased information as evidenced by the fact that it did not seem to alter their decisions in the light of that information; and (d) students often bought mean information which is virtually worthless.

The authors see a number of future research issues resulting from this preliminary investigation:

1. Why students are not acknowledging the use of the FtL strategy (at least in the oligopolistic-based simulation);
2. Are instructors who use simulations informing the students of the underlying economic factors and suggesting various strategies to the students;
3. A list of the most commonly used simulation in B-schools is needed as well as the underlying economic models of those simulations;

To what degree are students purchasing competitive information and, more importantly, how are they using that information.

In the analysis for this paper, the researchers looked at competitor's behavior as they may have reacted to the industry leader, with the industry leader being identified based upon reported team rankings. Teams are ranked in DECIDE based upon stock market value. If the industry leader has a stock market value that is significantly greater than the second team, is that more important in terms of a resulting FtL behavior than if the industry leader's stock market value is only slightly higher than that of competitors?

Additionally, in the analysis for this paper, there was no attention given to the impact on potential FtL in terms of two

Table 12
Price Behaviors Exhibited for Game Plays J through M

Quarters 1 and 2

Game	F	T	S	A	NA
J	1	3	5	9	1
K	6	2	3	7	1
L	4	1	0	9	1
M	3	1	2	6	1
Total	14	7	10	31	
%	23%	11%	16%	50%	16%

Legend for behaviors:

F = follow the leader's price
T = move toward and beyond leader's price
S = status quo (i.e. no change in price)
A = set a price away from leader's price
NA = not applicable since industry leader

Quarters 2 and 3

Game	F	T	S	A	NA
J	1	16	0	1	1
K	6	4	1	7	1
L	3	8	0	3	1
M	4	1	3	4	1
Total	14	29	4	15	
%	23%	47%	16%	24%	16%

very different situations. Situation 1 in which a dominant industry emerges during period one and remains in first place for a number of periods versus situation 2 in which the position of industry leader changes among several teams as the teams progress through several periods.

Although this study may have added to our understanding of the role of FtL behavior in simulation play, it is apparent that it may have opened up as many new questions as it may have answered. Clearly, additional research on the phenomenon of FtL behavior is called for if we are going to truly understand it.

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Table 13
Promotion Behaviors Exhibited for Game Plays J through M

Quarters 1 and 2

Game	F	T	S	A	NA
J	0	2	2	14	1
K	7	4	0	7	1
L	1	1	2	10	1
M	0	0	3	9	1
Total	8	7	7	40	
%	13%	11%	11%	65%	

Quarters 2 and 3

Game	F	T	S	A	NA
J	2	6	1	9	1
K	10	4	0	4	1
L	1	3	0	10	1
M	4	1	4	3	1
Total	17	14	5	26	
%	27%	23%	8%	42%	

Legend for behaviors:

F = follow the leader's promotion

T = move toward and beyond leader's promotion

S = status quo (i.e. no change in promotion)

A = set promotion away from leader's promotion

NA = not applicable since industry leader