

EVALUATION OF A COMMODITY FUTURES TRADING EXERCISE AS A LEARNING DEVICE IN AGRICULTURAL ECONOMICS

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INTRODUCTION

In the fields of agricultural marketing and agricultural prices commodity futures trading exercises are a popular means of injecting "real-world" problems into the classroom. There has been little published evaluation of such exercises. Available evaluations tend to be highly subjective.

This paper presents an analysis of a futures trading exercise which has been incorporated in a senior level agricultural prices course taught by the author for the Fall Semester of the years 1970-72. The exercise is briefly described. Results of the exercise are reported. Significant implications of the results are quantitatively tested. Finally, some brief subjective comments are added on implications which can not be empirically evaluated at this time.

Operation of the Futures Trading Exercise

The same operating rules have been in force during the three years the exercise has been run. Each student starts with \$5,000 in his account. The instructor acts as broker, specifying initial margin, added margin, brokerage fees applicable, etc. and recording trades executed. The student is free to trade in any commodity quoted in the Wall Street Journal futures market report which covers all major U.S. futures exchanges and leading commodities.

Each student is required to make an initial commitment in the market by the end of the second week of the semester and after that date to be out of the market for no more than one week at a time. To encourage thoughtful trading the student is required to submit in writing on each trading request the economic reasons for that trade. At the end of the semester the student is required to write a brief report evaluating his own trading in terms of the soundness of his economic reasoning, the reliability of the information on which his reasoning was based and the factors not considered at the time of entering each trade which appeared to have influenced a given market.

Grading is based on the level of trading activity throughout the semester, success in buy, sell or hold decisions, soundness of economic reasoning on each trade and the logic, clarity and documentation of the final student assessment of his own trading.

Students are prepared for trading by two introductory lectures describing the structure and role of commodity futures markets, types of market participants, trading terms, and technical aspects of trading. Use is made of readings in brokerage house pamphlets, literature from commodity exchanges, agricultural price analysis textbooks, etc. Every effort is made to prevent market technicalities being a deterrent to trading.

Summary Results 1970-72

Overall results of the exercise varied considerably from year to year (Table 1). In 1970, students lost money on 57.5 percent of all trades. However, very high brokerage commissions, fees, and margin losses left almost three quarters of participants financially in the red. In contrast, in 1971, with greatly reduced commissions, only 40 percent of participants lost money over the semester. In 1972, large profits on some individual trades brought the best overall financial results of the three years. For all three years combined wins and losses were about equally balanced with students overall showing an average gain of \$71.

Individual results, as in the real world, were on occasion dramatic. One student in 1970 accumulated \$10,144 in losses during the semester while in both 1971 and 1972 one student gained about \$6,800. The type of position taken by participants was analyzed only for 1972. Four out of five positions taken were long (buy trades), a ratio typical of small commodity futures traders in the real world.

Data was available to examine how futures trading performance was related to general academic record, course grade and academic background (Table 2). A-students in the course made the greatest number of trades and got the highest futures grade. However, B-students made by far the greatest financial returns. C-students had lowest trading activity, lowest grades, and worst financial returns. Non-majors made fewer trades per head than agricultural economics majors, but had vastly superior financial results and a fractionally higher futures grade. The better ag econ students were able to compensate for lack of financial success by superior performance in reporting their results.

When average course grade was compared with average GPA for the participating students it was clear that rating of the students in the total course closely reflected previous academic performance. However, the average futures grade or average ranking in financial results reflected average GPA poorly.

Regression analysis was used to explore the relationship between student characteristics and futures exercise performance. In general, the statistical properties of the regression runs were so poor that none of these characteristics alone or in combination helped explain or predict futures exercise performance. Analysis of the simple correlation coefficients indicates why (Table 3). Futures grade had a correlation significantly different from zero only with number of trades. This is not surprising since trading activity was a factor considered in determining futures grade. It was surprising that course grade or student GPA was not significantly correlated with futures grade.

Course grade was significantly and positively correlated with GPA, suggesting that in general the instructor's grading criteria were compatible with that of other instructors encountered by the students.

TABLE 1 - Summary results of commodity futures trading exercise, all participants, 1970-72

	1970	1971	1972	Total
Participants				
Total (Number)	19	20	15	54
\$ Gainers (Number)	5	12	9	26
\$ Losers (Number)	14	8	6	28
\$ Losers (Percent)	73.7	40.0	40.0	51.9
Trades				
Total (Number)	80	62	54	196
Winning (Number)	34	36	29	99
Losing (Number)	46	24	25	95
Losing (Percent)	57.5	38.7	46.3	48.5
Trading Results				
Gains (\$)	14,392	26,553	36,763	77,708
Losses (\$)	-27,958	-14,149	-9,052	-51,159
Net (\$)	-13,566	12,404	27,711	26,549
Financial Results				
Commissions (\$)	-10,014	-3,853	-2,944	-16,811
Margin calls (\$)	(a)	-2,068	-3,847	-5,915
Net (\$)	-23,580	6,483	20,920	3,823

(1) Included in Commission costs.

Evaluation of quantitative results

The results reported above offer little comfort to an instructor. The better students by academic measures did not maintain their clear superiority in a "real-world" exercise. At the same time, the relative success of non-ag econ majors (whose business background tended to be even less than that of ag econ majors) does not conform to expectations. If futures grade and course grade are an accurate measure of student mastery of subject-matter, then mastery of the "real-world" problem did not appear to benefit mastery of overall course content.

If futures grade is not an accurate measure of student mastery of economics applied to the real world, the exercise can not then be judged useful either in deepening the student's understanding of economics or in preparing the student to tackle "real-world" economic problems.

A further alternative is that the futures trading exercise is conceptually useful but suffers from operating deficiencies which limit its value. For example, the normal futures contract is active for about twelve months. In the course of a three-month exercise students are exposed to only a small number of trading opportunities and only some of the possible market vagaries. Over a longer time-span, students might gain a new depth of perception into the application of economic concepts to a real-world situation. The obvious solution would be to extend the exercise over a two semester sequence. Where this is not possible, the value of the futures trading exercise might be enhanced by devoting more time to it in a one-semester course, or by concentrating effort on one or two commodities.

TABLE 2 - Commodity Futures Trading Exercise, Relative Performance by Selected groups, 1970-72

Group Number	Average Grade			Average Rank			Average Financial Result			
	Futures %	Course %	G.P.A.	Futures	Course	G.P.A.	(No) Trades	(\$ Net)	(Rank)	
Total	54	11.1	78.2	2.87	8.4	9.6	9.6	3.6	70.8	9.6
Course Grade										
A	26	11.8	84.3	3.21	6.2	4.8	6.2	3.8	295.4	10.0
B	13	11.3	78.1	2.77	7.2	11.5	10.8	3.7	667.8	7.8
C or less	15	9.8	67.7	2.38	13.0	16.3	14.6	3.3	-836.0	11.1
Major										
Ag. Econ.	40	11.1	79.1	2.93	8.7	9.0	9.0	3.7	-330.1	10.0
Other	14	11.2	75.6	2.70	7.5	11.5	11.4	3.4	1216.1	8.6

TABLE 3 – Direct correlation coefficients of key variables, commodity futures trading exercise, 1970-72

	Futures Grade	Course Grade	GPA	Number of Trades
Course Grade	.20			
GPA	.28	.66*		
Number of Trades	.35	-.03	.17	
Dollar Gain	.09	.17	-.03	-.12

*Significantly different from zero at 5% level of significance.

Subjective evaluation

Much more empirical research is needed on the value of alternative forms of the futures exercise and other "real-world" exercises. In the meantime, logic still suggests that there are tangible benefits from incorporating such exercises in ag econ courses.

Many students express surprised fascination with the completion of real-world marketing and pricing decisions. The exercise format leads them to read news stories and market comment with caution. They learn the value of individual inquiry in helping to reach trading decisions. The

process of developing an economic hypothesis about future market behavior and testing it by a real-world decision, leads to re-evaluation of their theoretical framework, data sources and application of theory to the data. They learn that answers to economic problems do not come in neat packages (even to instructors) and that the marketplace is an arbitrary master. The hope is that in subsequent employment they will approach economic problems with similar scientific caution.

Summary

Evaluation of three years experience of a commodity futures trading exercise in a senior level agricultural prices course yielded little evidence that prior training aided performance in the exercise, or that the exercise deepened the student's understanding of economics. Grading of the exercise was strongly influenced by the student's skill in typical academic procedures such as report writing. One implication of the analysis was that the exercise required a greater length or concentration of class effort to contribute significantly as a learning device. We need to know much more about why and how such exercises can help our ag econ students learn better.

SUBURBAN RECRUITMENT: A Developing Function of A College of Agriculture

Clifford L. Nelson and Robert K. Heritage

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Many land-grant universities are located in or near large urban centers. Currently at the University of Maryland, close to half of all undergraduates in agriculture have urban or suburban origins. Many turn out to be outstanding students. Colleges of agriculture are having to look more and more to these sources for their enrollees. Less than 5% of our population nationally live on farms and the trend is for even less. Therefore the historically typical source for most agriculture students is likely to produce even fewer students in the future.

The College of Agriculture of the University of Maryland has conducted over the past 4 years two major programs for high school age students. Although recruitment is considered as a possible outcome of these programs, education and public relations are the major goals. The first program, Science in Action, has been designed for outstanding science students in every high school in the state. Invitations are issued to science teachers through county science supervisors (Maryland has county-wide school districts) in cooperation with the State Department of Education Specialist in Science.

Science in Action, since its inception, has had over 2600 students to the one-day program. The program during the day includes an explanatory assembly and visits to three 45 minute demonstrations and displays. Last year there were 51 different programs. Students are preassigned to groups. Topics included such diverse titles as Electronic Controls for Scientific Farming, Peanut Butter, Cancer and DMSO, and Environmental Physiology-Hibernation Studies.

Agricultural Careers Congress is the other large program for Maryland high school students. Designed for mainly sophomores and juniors, the Careers Congress has been an educational program designed to show students the potential job opportunities in agriculture.

The purpose of selecting younger students to participate is to ensure that, if they choose to pursue an agricultural career, they will still have opportunity to prepare themselves for university study. Contact is made with high school students through each counselor in the state. Counselors are contacted with the cooperation of the State Department of Education and the supervisors of counseling in each county. Vocational agriculture instructors as well as cooperative extension personnel are also contacted to promote the program. Over 1600 students have attended Agricultural Careers Congress during the past 4 years.

Programs in the Careers Congress have been developed around broad based presentations in animal science and plant science. Students have been asked to choose either plant or animal science as their main interest and they are also asked to

choose which department or program they have the most interest in. The students then attend a series of presentations in various fields of agriculture including the one they chose first.

A less formal approach involving recruitment has been the participation of several professors in the University speakers bureau and by acting as resource individuals to high school classes. The Agricultural Engineering Department has a portable promotional display that has been in many schools and fairs in the state. Students getting to know professors seems to have a very positive effect on student enrollment in university programs also. In agricultural education it is noted that students who decide to go on in this field from agricultural programs in the state very often come from schools where student teachers in agriculture are placed and high school students have opportunity to meet and to get to know university personnel.

An example of knowledge of university personnel and participation in college programs can be drawn from High Point High School which is near the University of Maryland. Although an academically oriented, 2300-student school, High Point has a very successful horticulture program. Annually more students than can be accommodated choose the horticulture elective.

The horticulture teacher, Robert Heritage, was trained as a vocational agriculture teacher and just completed a masters' program at the University of Maryland. One of his major goals in instruction has been to make students aware of the opportunities in agriculture even though all students come from suburban backgrounds. In addition, during 1971 and 1972 student teachers from the Horticulture Education curriculum have been placed in this school.

The following table gives a breakdown on the High Point High School Horticulture graduates of the past 3 years:

Table 1 – Horticulture Graduates 1970, 1971, 1972

	70 Grads.	71 Grads.	72 Grads.
2 year agriculture programs	2	8	5
4 year agriculture programs	4	4	9
Attend college in other majors	14	14	14
Military service	3	2	1
Work in horticulture	0	1	0
Other employment	15	8	13

It is evident, at least in the case of High Point High School, that some of the recruiting and contact methods have been successful. The College of Agriculture is still planning to continue the programs. Student and adult evaluations of the Science in Actions and Careers Congresses have been uniformly positive. Expanded public relations and involvement of the state with the College have been results of these activities and contacts with potential students in agriculture have been greatly increased.