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AECN 399: Commodity Market Analysis—A Peer Review of Teaching Project Benchmark Portfolio

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AECN 399 – Commodity Market Analysis

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Peer Review of Teaching Portfolio

University of Nebraska-Lincoln

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Introduction

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Objectives of Peer Review Course Portfolio

I have been teaching for a few years, in different universities and different courses. I have taught large classes (over 100 students) and small classes (approximately 10 students), introductory courses and advanced courses, and in 4-year programs as well as 2-year programs. Although I believe that principles of good teaching can be applied to any course, I feel that teaching methods may need to be adjusted to different courses, different student population and distinct class size. So I welcomed the opportunity to participate in the "2013-2014 Peer Review of Teaching Program" because it gave me a chance to join a forum where I could systematically discuss and learn with (and from) my peers ideas that will lead to the improvement of my course material and teaching techniques, along with the development of new approaches and concepts that can be incorporated to my course in the future.

My main purpose with this portfolio is to share my course and my ideas with people inside and outside the academic world and hopefully contribute to the discussion of how to improve teaching. When I applied to participate in the "2013-2014 Peer Review of Teaching Program" I had the overall objective of becoming a better teacher and improving my course. Sharing my experience with this course in the spring of 2014 will allow others to understand how and why I structured the course the way I did, and get insights from what worked and what did not work. And hopefully it will also allow me to receive comments and suggestions that can help me improve the course in coming years.

Description of the Course

This course is being offered by the first time in my department. Its current number–AECN 399– is actually the official number for "Independent study in agricultural economics". It was decided to start it as a section of the "Independent study" course because we wanted to make sure that the course can be useful for students and there is enough demand for it.

The motivation for the course comes from the importance of market analysis and price forecasting in various levels of commodity markets. Participants in commodity markets are constantly trying to forecast prices. A sound analysis of expected prices in the future is important in many dimensions. For example, it is useful for producers and merchandisers as they develop their marketing and risk management strategies during the crop year. It is also relevant to financial institutions providing loans to the agricultural industry as they assess financial performance and credit risk of their clients. Another aspect of market analysis is the short-run trajectory that prices follow until they reach their long run forecast. This information is also important as it relates to the timing of decision-making in commodity markets. For example, it is relevant for producers and merchandisers not only to define a marketing or risk management strategy, but also to determine the best time to implement it.

Two methods have been widely used to forecast prices and their trajectories: fundamental analysis and technical analysis. Fundamental analysis focuses on economic data (such as production and consumption) to forecast prices, while technical analysis studies patterns in price data. Market participants have long debated which method is better, but it is as easy to find successful practitioners who rely on fundamental analysis as it is to find successful practitioners who use technical analysis. The purpose of this course is to discuss how fundamental and technical analysis have developed and are used in commodity market analysis, their strengths and weaknesses, and whether these methods can complement or substitute each other.

Course goals

The overall objective of this course is to teach students how to analyze commodity markets using fundamental and technical approaches. The most common techniques from each approach will be discussed, focusing on how they can be implemented, their advantages and disadvantages,

how they differ and how they can complement each other in commodity market analysis. At the completion of this course, students should be able to:

a) have a thorough and workable knowledge of the forces that affect commodity markets

b) apply different techniques in fundamental and technical analysis, along with critical thinking, to evaluate and solve real-world problems in commodity markets

c) discuss and support their opinions using fundamental and technical tools

d) appreciate the importance and complexity of fundamental and technical analysis in commodity markets and understand that nobody can consistently make accurate predictions about market movements

e) realize that no technique is complete and unfailing

f) understand that commodity markets are dynamic and different scenarios and circumstances require different approaches to analyze commodity prices

g) realize that fundamental and technical tools are useful to organize their thoughts when analyzing commodity markets, and not a set of facts to memorize

h) understand the consequences of decisions based on market forecasts and be mindful of those consequences in their professional activities

i) recognize that market analysis is a combination of science and art; i.e. effective market analysis requires knowledge of scientific techniques as much as human judgment based on institutional understanding about markets

Context

My department, Agricultural Economics, is working on enhancing its expertise in commodity marketing and risk management in all areas (research, teaching and extension). As part of this plan, three faculty in this field were hired in 2013/14. I am one of them and the only one of these three with a teaching appointment. One of my jobs is to teach some of the current undergraduate courses in commodity marketing and risk management, and also develop new courses in this area. The course under discussion in this portfolio was the first new course that we offered as part of the efforts to expand our "commodity marketing and risk management" area.

Another part of these efforts is the creation of a computer lab with the specific purpose of simulating commodity markets and help students gather hands-on experience in marketing and risk management. When it is ready, the lab will be heavily used for this course–Commodity Market Analysis–and also for the three other courses in the same area (one of these is also a new course that will be offered for the first time in the fall of 2014).

Enrollment/demographics

There were 9 students enrolled in the course. They all had similar background and interests, as suggested by a quick survey that all students answered on the first day of class and also by my interaction with them during the semester.

In the survey on the first day of class, I learned that 7 students were seniors and 2 were juniors, so for most of my students this was their last semester in the university (**Table 1**). I also learned that 7 students were majoring in either agricultural economics or agribusiness (both majors in the Department of Agricultural Economics). The only two students with different majors still had market-oriented interests, with one majoring in business administration (with a minor in finance) and the other majoring in animal science with a business option (**Table 1**).

This market-oriented background was also reflected in their career plans. One question in the first-day-of-class survey asked about their career plans, and they could check more than one alternative. The answers show that 8 students consider a career in the agricultural industry, and 3 of them checked that as their only answer (**Table 2**). The next most popular answer was farming, which was checked by 5 students (but only one of them chose it as his only choice). An indication of their market-oriented mindset may also be gauged by the indication that 4 students consider running their own businesses, although none of them selected this option as their only answer (**Table 2**).

Finally, I also wanted to have a sense of students' previous knowledge of the course subject. I included two questions in the first-day-of-class survey asking them to choose an answer regarding whether they knew fundamental analysis and technical analysis. The answers were similar for the two types of analysis (**Table 3** and **Table 4**). No student had never heard about the topic, which appears to be natural; otherwise they would probably not have chosen to

take the course. Only 2 students said that they had just heard or read about fundamental analysis and technical analysis in the news, while the other 7 students had taken a course that discussed the topic, studied by themselves and/or used fundamental and technical analysis in their jobs.

Therefore, students enrolled in the course were essentially market-oriented and had had some exposure to fundamental and technical analysis before.

Table 1: Students' year in college and areas of specialization

Student #	Year in college	Major	Minor
1	Senior	Agricultural economics	-
2	Senior	Agricultural economics	-
3	Junior	Animal science (business option)	-
4	Senior	Agricultural economics	-
5	Junior	Agribusiness	Finance
6	Senior	Agricultural economics	-
7	Senior	Business administration	Agribusiness
8	Senior	Agricultural economics	-
9	Senior	Agribusiness	-

Table 2: Number of answers to "What are your career plans?"

Student #	Farming	Agricultural industry	Financial industry	Own business	Other	Not sure yet
1	x					
2		x				
3	x	x		x		
4	x	x	x	x	x	
5	x	x		x		x
6		x				
7	x	x		x		
8		x				
9		x				
total	5	8	1	4	1	1

Table 3: Answers to "Do you know what fundamental analysis is?"

Student #	Yes, I heard or read about it on TV/internet/etc	Yes, I took a course that discussed it	Yes, I studied it by myself	Yes, I used it for my own business/trading/etc	Yes, I used it in my work/internship	No, I have never heard or read about it and do not know what it is
1	x					
2		x			x	
3	x	x	x		x	
4	x	x				
5	x					
6	x	x		x		
7					x	
8		x			x	
9	x	x	x		x	
total	6	6	2	1	5	0

Table 4: Number of answers to "Do you know what technical analysis is?"

Student #	Yes, I heard or read about it on TV/internet/etc	Yes, I took a course that discussed it	Yes, I studied it by myself	Yes, I used it for my own business/trading/etc	Yes, I used it in my work/internship	No, I have never heard or read about it and do not know what it is
1	x					
2		x				
3	x	x	x		x	
4		x				
5	x					
6	x	x		x		
7					x	
8		x			x	
9	x	x	x		x	
total	5	6	2	1	4	0

Teaching Methods, Course Materials and Activities

The course was designed to discuss three broad topics: markets, technical analysis and fundamental analysis. Different teaching methods were used throughout the course, but consisted basically on classroom lectures, classroom discussions and computer lab sessions. Additionally, quizzes, assignments and exams were also adopted

In the classroom: 1st part of the course

In the first topic I wanted to have a general discussion of how markets work, how prices are determined and where one can find information and data about markets. The main purpose was to help students understand that many variables affect how prices are determined in commodity markets, and show them where they can find information about those variables. This should set the stage to the next two topics–technical analysis and fundamental analysis–which would discuss systematic ways to use that information and data to analyze markets. In the first part I had more classroom lectures, which covered theoretical concepts about markets and how information is incorporated into prices. This part took the first three lectures of the course. Then I was planning to start with technical analysis, but I ended up making a few changes after consultation with the students.

The CME Group Commodity Trading Challenge: a quick adjustment

Every year the CME Group, which is the largest futures and options exchange in the world, organizes the "CME Group Commodity Trading Challenge". This competition consists of simulated trading in commodity markets during a 2-week period and is open to university students all over the world. Groups of up to 5 students are allowed to register, with a limit of two groups per university. Since this competition is closely related to commodity markets, I told students about it and offered to help in case they wanted to participate. I expected that some students would be interested, but it turns out that all of them wanted to participate.

We ended up with two groups (one with 5 students and the other with 4 students) registered in the "CME Group Commodity Trading Challenge" and, since all students were

interested, I decided to make it part of the course. So I spent the next two weeks of the course discussing two points: general ideas about trading and overview of technical analysis. Since students were in a trading competition, they needed to know the basics of how to trade in futures markets for commodities. Given my practical experience in the subject (I started my professional life as a trader and analyst in futures markets), I gave the students an overview and some hints on how trading is executed and what they needed to pay attention to when making trading decisions. Then I also discussed general ideas about technical analysis, so that they could use something "concrete" in their trading decisions instead of just "guessing".

Despite the poor timing of the "CME Group Commodity Trading Challenge" (it would be more beneficial to students if it happened later in the semester); I thought it would still be a good learning experience for students. It would allow them, in the context of commodity trading, to witness first-hand how hard it is to analyze and forecast commodity markets. In addition, I believed I should take advantage of students' interest and excitement with the competition to help them learn about topics related to the course.

In the classroom: 2nd and 3rd parts of the course

After two weeks with the CME challenge, we moved forward with a more comprehensive and detailed discussion of technical analysis. We spent 6 weeks in that part, using a combination of classroom lectures and discussions and also computer lab sessions. In the third part of the course we discussed fundamental analysis, which covered the last 5 weeks of the course. Again, I used a combination of classroom lectures and discussions and also computer lab sessions.

In both cases, I used classroom lectures to explain the theory, details and calculations of different techniques in technical and fundamental analysis. Classroom discussions were then adopted to help students think about similarities and differences between techniques, and also potential problems with those techniques. For example, in technical analysis there are several indicators developed to indicate the direction that market prices are heading to. Each indicator is calculated in a different way, essentially because they were developed to assess price behavior under distinct circumstances. So I used classroom discussions to motivate students to think about questions such as "if corn prices have been steady and suddenly start going up, which technical indicator(s) will be the first to signal this upward movement?", or "if corn prices have been

steady, is it possible that one of the technical indicators we just discussed will erroneously signal the beginning of an upward movement?".

Computer lab sessions were also adopted during the discussion of technical and fundamental analysis. The purpose was to give students a chance to practice what they were learning on real-world problems. For example, one dimension of technical analysis is to look at price charts and try to identify patterns that repeat over time. When we were discussing this point we met in the computer lab. Then I asked students to go to some specific websites that have price charts for several commodities and try to identify as many patterns as they could. During this exercise we would look at each other's charts and discuss whether we had a pattern there or not. One criticism to this technique is that pattern identification can be subjective. Doing this exercise in the computer lab with students being able to look at different charts and share them with others was very important; because it helped highlight and discuss this criticism (it was clear during the exercise that not everybody could "see" the same patterns). Another example was the use of statistical techniques to explore how supply and demand variables affect commodity prices. We went to the computer lab and used statistical softwares to estimate how changes in supply and demand cause changes in prices. In the lab we could work together, step by step, in this procedure and along the way I could emphasize important points and show them how the estimation could go wrong if they missed some of these steps.

Special activity at the end

Finally, I planned a 'special' activity for the end of the course, which was a presentation of market analysis prepared by the students to a panel of industry professionals and professors in the department. I split students into 3 groups (3 students in each group) and they had 2 weeks to prepare a presentation with market analysis for corn, soybeans and cattle. They had some flexibility in how to prepare the presentations, but they were required to use both technical and fundamental analysis in their reports. They could choose what technique they wanted to adopt within technical and fundamental analysis, but they had to use at least something from each approach. During those 2 weeks I had them submit to me drafts of their reports, so that I could provide feedback and make sure they were on the "right" track.

On the day of the presentation we had 6 guests in the classroom: 4 professionals who work in the agricultural industry and whose jobs are closely related to commodity market analysis and price forecasting; and 2 professors from my department who have experience with commodity market analysis. I asked students to present their work and then let them discuss ideas with and answer questions from our guests. My purpose was to help students realize how industry professionals think about commodity markets and do their own market analysis, and also that different people have different ideas and approaches to commodity market analysis.

Evaluation tools: quizzes, assignments and exams

During the course students worked on 5 quizzes, 10 assignments and 2 exams (midterm and final), which addressed all parts of the course and were done either individually or in groups (**Table 5**). All quizzes, assignments and exams were designed to help students learn the material and understand the value and also pitfalls of fundamental and technical analysis, as will be further discussed in the next section. The choice between individual and group work relied essentially on the type of quiz or assignment and the amount of material involved. For example, they worked in groups for the quiz and two assignments related to the CME Group Commodity Trading Challenge because they participated in the competition in teams. Quiz 4 was done in groups because it was based on a topic had just been discussed in class, and I wanted them to share ideas with each other before submitting the answers by the end of the class. Assignment 9 was the "special activity" mentioned previously. It was done in groups because of the amount of work involved and the importance of discussing different ideas before arriving at the final analyses. Finally, even for the individual quizzes and assignments, students were encouraged to discuss their answers with each other. I felt it was important for them to share ideas and learn (i) how different people could use different techniques and interpret results in various ways even though they were analyzing the same market, or (ii) how different people could use the same techniques and still interpret results in various ways as they analyzed distinct markets.

Table 5: Characteristics of the quizzes, assignments and exams

	Topic	Type
Quiz 1	Markets	Individual
Quiz 2	CME Challenge	Group
Quiz 3	Markets	Individual
Quiz 4	Technical analysis	Group
Quiz 5	Fundamental analysis	Individual
Assignment 1	Markets	Individual
Assignment 2	Markets	Group
Assignment 3	CME Challenge	Group
Assignment 4	Technical analysis	Individual
Assignment 5	CME Challenge	Group
Assignment 6	Technical analysis	Individual
Assignment 7	Technical analysis	Individual
Assignment 8	Technical analysis	Individual
Assignment 9	Fundamental analysis	Group
Assignment 10	Reflections on the course	Individual
Midterm exam	Markets and technical analysis	Individual
Final exam	Fundamental analysis	Individual

How teaching methods relate to course objectives

The course objectives listed in the syllabus were:

a) have a thorough and workable knowledge of the forces that affect commodity markets;

b) apply different techniques in fundamental and technical analysis, along with critical thinking, to evaluate and solve real-world problems in commodity markets;

c) discuss and support their opinions using fundamental and technical tools;

d) appreciate the importance and complexity of fundamental and technical analysis in commodity markets and understand that nobody can consistently make accurate predictions about market movements;

e) realize that no technique is complete and unfailing;

f) understand that commodity markets are dynamic and different scenarios and circumstances require different approaches to analyze commodity prices;

g) realize that fundamental and technical tools are useful to organize their thoughts when analyzing commodity markets, and not a set of facts to memorize;

h) understand the consequences of decisions based on market forecasts and be mindful of those consequences in their professional activities; and

i) recognize that market analysis is a combination of science and art; i.e. effective market analysis requires knowledge of scientific techniques as much as human judgment based on institutional understanding about markets.

The first part of the course, when we discussed how commodity markets work and what variables affect prices, relates to objectives (a) and (f) above. Classroom lectures were adopted to give students the theoretical foundation to understand how markets work and identify forces that impact prices. Classroom discussions were used to help them share their ideas with classmates, think about their meaning and reflect on how different scenarios lead to distinct price outcomes. The two quizzes on this topic were prepared to help students consolidate the ideas shared during the discussions, while the two assignments were designed to make them collect information and data on commodity markets so that they could become familiar with resources about markets.

The other parts of the course, when we discussed technical and fundamental analysis, relate to course objectives (b), (c), (d), (e), (g) and (i) above. Classroom lectures were again adopted to give students the theoretical foundation, showing them the how different techniques in technical and fundamental analysis were developed and the calculations behind them. Classroom discussions were used to allow students to think critically about similarities and differences between those techniques, realize that no technique is perfect, and understand that industry professionals typically adopt a combination of techniques in their analyses. Quizzes and assignments were designed to make students analyze real-world commodity markets applying the tools they learned and discussed in class. Then they could experience first-hand how to use those instruments in actual markets, realize that using different tools could result in different conclusions, and understand that the effectiveness of different tools could vary across commodities and across market conditions.

Finally, course objective (h) was mostly approached by classroom discussions. The consequences of decisions based on market forecasts were discussed as examples as we talked about distinct ways that industry professionals use technical and fundamental analysis.

The Course and the Broader Curriculum

As I previously mentioned, my department has been making efforts to enhance its expertise in commodity marketing and risk management in all areas (research, teaching and extension). This course is one of the outcomes of this effort on the teaching side. It was developed to be integrated with the two undergraduate courses currently offered by the department in commodity marketing and risk management, which are AECN 325–Marketing of Agricultural Commodities and AECN 435–Advanced Commodity Marketing.

Even though we have not determined pre-requisites among these three courses, we envisioned that student should take AECN 325 first, and then AECN 435 and this course (ideally at the same time, since both are offered in the same semester). However, during discussions during the spring of 2014, the idea of establishing this course as a prerequisite for AECN 435 emerged. The person who teaches AECN 435 feels that the content of this course can be very beneficial for students taking his course.

Regardless what we decide in terms of prerequisites, our intention is that students interested in commodity marketing and risk management should take all these three courses, in addition to a new one that will be offered for the first time in the fall of 2014 and possibly another one which may be created for the next academic year. The instructors involved in all these courses have been constantly in contact with each other in order to guarantee that the topics taught across courses are consistent and aligned in a way to help student learning.

Analysis of Student Learning

In this section I will discuss several dimensions of student learning. Overall most students learned the course material well and I feel the course objectives were generally met, which is suggested by students' final grades (**Figure 1**). However, there are nuances of this overall statement that are worth discussing in more detail, along with differences in performance across students.

Figure 1: Final grades for all students [a]
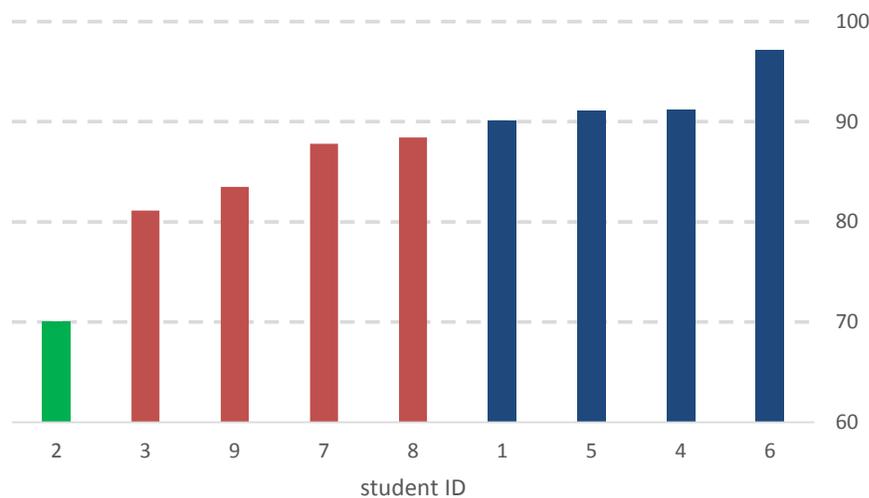
(a) colors indicate letter grades: blue = A, red = B, green = C

Evolution of students work

In this part I will discuss evolution by comparing students' work in assignments 4, 6, 7 and 8. In these assignments students were essentially asked to (i) use certain tools in technical analysis to analyze a given commodity market and (ii) make a short-term price forecast based on their analysis. Assignment 4 was the first one with this structure, while assignment 8 was the last. In general they were able to address item (i) reasonably well, i.e. they could understand how to use a certain tool and apply it to a given commodity market. However, item (ii) required more work during the semester. Thinking about what those tools were telling them at a given point in time and then taking the next step to make a solid, resonated-out price forecast was a skill that some students developed over time. Note that I was not evaluating whether their price forecasts were

right or wrong; instead I wanted to see whether they were able to think about prices in a systematic way and use objective measures to do their forecasting.

I will start discussing this point with examples below shows price forecasts from student 1 in assignment 4, followed by his price forecast in assignment 8. Recall that student 1 was one of the two who had only heard about technical and fundamental analysis in the news before taking this course, as opposed to others who had seeing something about these tools in other courses, in their jobs/internships or even studied by themselves (Tables 3 and 4). In assignment 4 there were a few vague ideas with little content, essentially saying that prices had been going up and down and thus it was hard to say what would happen next. In assignment 8 there was a much more elaborate discussion based on concrete facts. The student still felt it was hard to do the forecasting, but then he used specific tools and objective numbers to explain that the technical indicators he used showed somewhat contradictory results, which made it difficult to point to a specific direction.

[Assignment 4] *"I believe prices remain uncertain. It is hard to say with confidence in whether the market will go up or down as there is fluctuation in both directions. Prices have continued to increase although there have been days where it closes lower than the open. I believe the price will continue to increase but may drop off soon as they seem to be increasing at a decreasing rate."*

[Assignment 8] *"The market has started to narrow so it is difficult to tell what it will do next. The MACD is the only figure, which shows that it will continue to decrease. The RSI is near zero so the market has lost most of its strength. The Stochastic is hard to judge since they are near the 50 mark and are neither overbought nor oversold. The OBV does show a rise in volume with price which shows the trend may continue. The A/D is still high, but it has stopped increasing, which may mean that the trend is weakening. The Chaikin has showed little change over the last month except for a slight decrease since its peak. Buyers may still have the power to push up the market further. Conclusion: I believe prices will continue to increase at a decreasing rate for the coming weeks with a possible retracement soon to come."*

Other students also showed improvement in their analyses, but in a different way. The others had already had some contact with technical and fundamental analysis, and some of them

were currently doing internships that gave them close contact to commodity markets. Therefore, these students didn't show just a few vague ideas in assignment 4 (as the student discussed before), but their forecasts in that assignment sounded like hear-say and somewhat casual observations in the market. The example below compares the price forecasts from student 9. In assignment 4 he seemed to be listing some general news about corn and soybean markets, while in assignment 9 his opinion is based on specific tools which allowed him to objectively determine the price direction. Regardless his forecast was right or wrong, at least he learned a method that allowed him to analyze markets in a consistent way.

[Assignment 4] *"Corn is currently trading in a relatively docile market and has been trending fairly sideways. Soybeans however have more activity going on with the current harvests taking place in South America. Over the long weekend I have heard news of unfavorable weather in South America which may lead soybean buyers on a frenzy come Tuesday. If we do see large gains in soybeans, corn buyers may also draw the corn market upward. A decent gain coming from fundamental factors on Tuesday may then draw the market down come Wednesday. Throughout the week I don't think that corn will rise above the 4.50 limit where I have a longer term resistance set."*

[Assignment 8] *"The stochastic are currently moving out of the overbought zone and I think this is a big indicator that traders don't think the current up trend is over. We can also see that the OBV is growing larger is going to weaken after we had a large trading volume on Monday after two large reports were released. The CMF is currently getting lower so that may indicate that the uptrend is slowing but still continuing. Almost every indicator is showing that the up trend will continue but at a slower pace."*

Students 4, 5, 6, 7 and 8 showed similar evolution as student 9 discussed above (their price forecasts in assignments 4 and 8 are shown in the appendix). However, two students (2 and 3) did not follow the same pattern. Price forecasts written by student 2 are presented below. In assignment 4 his forecast was based on a simple observation of the price change on a particular day. In assignment 8 he used some more information about the market, but still shows objective numbers to support his opinion or any method allowing him to systematically think about markets. Student 4 was a similar case and his work can also be seen in the appendix.

[Assignment 4] *"I predict that the prices will go up in the upcoming weeks. Gradually, I foresee the prices going up. They may have similar decreases but the large increase from the opening to the closing on the last day makes me think that the market will continue going up."*

[Assignment 8] *"Based on the trends and how the market has similarly acted in the past, I predict that prices will continue to go up and slowly begin to plateau off after not too long. This will in turn cause the downward trend to happen again. Soon, we will also know the amount of acres dedicated to corn growth and see how wet the spring season will be and get an idea on what to expect come harvest time. Knowing these facts later on will determine a lot of the trends to come. Until this knowledge is known, very little can be predicted about what the future holds."*

I could have also explored learning evolution by comparing grades across time. For example, I could look at average grades in each quiz, assignment and exam and compare them over time. However, I feel this is not appropriate for his particular course for three reasons. First, there was a combination of group and individual work during the semester, so it could happen that some individual grades were biased because they could reflect the work of the group rather than the work of the individual student. Second, there was a variety of types of quizzes and assignments, some focusing on general ideas and some focusing on specific topics, and, most importantly. Third, I graded assignments differently during the course. In most assignments I asked students to analyze a specific market using the tools they were learning in class. In the beginning they had not yet learned much, so I would not expect much from the analyses. As the semester progressed and they learned more tools, I started expecting better and more complete analyses. Essentially, I adjusted my grading criteria to the how much students were capable of doing according to the progress of the course.

Grades in assignments and exams

Assignments, quizzes and exams were used in the course with different purposes. In the assignments and some quizzes students were asked to use the tools and techniques learnt in class to analyze real-world commodity markets. In exams students were asked theoretical questions, in the sense that they had to explain and discuss details of how those tools and techniques were

developed and how they work, and also think about situations in which they may go wrong. So assignments were hands-on exercises that required students to know how to apply what they were learning, while exams required theoretical knowledge and critical thinking (assignments also required some degree of critical thinking, but not as much as in the exams).

In particular, assignments 4, 6, 7 and 8 and the midterm final addressed technical analysis. I calculate the average grade in these four assignments and compared it to the midterm exam grade for all students. The scatter plot in Figure 2 shows the results. All but two students obtained better grades in the assignments than in the midterm exam. Similarly, assignment 9, quiz 5 and the final exam addressed fundamental analysis. Scatter plots of the final exam grade against the average between assignment 9 and quiz 5 grades are presented in Figure 3. Again, all but two students performed better in the assignment and quiz than in the final exam. These findings seem to suggest that students generally performed better in hands-on, applied exercises than in theoretical discussions. Interestingly, the two students who were exceptions to this point are the same in **Figure 2** and **Figure 3** (but note that their grades are mostly very high in both assignments and exams, so there is no strong evidence that they did better in one type of exercise than in the other).

Figure 2: Scatter plots of grades for midterm exam and average grades for assignments 4, 6, 7, and 8 (technical analysis)
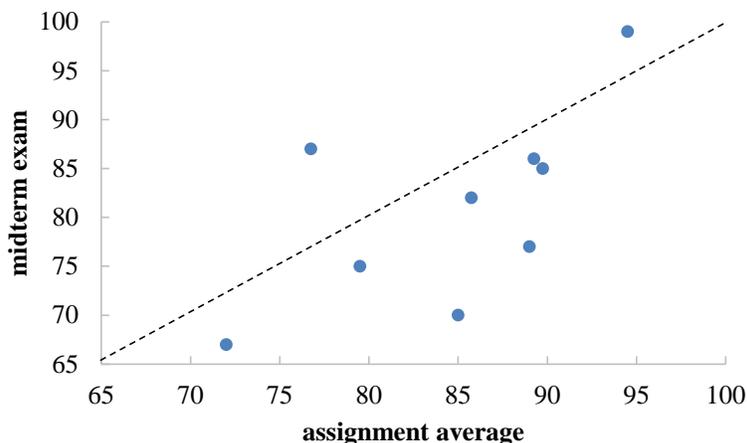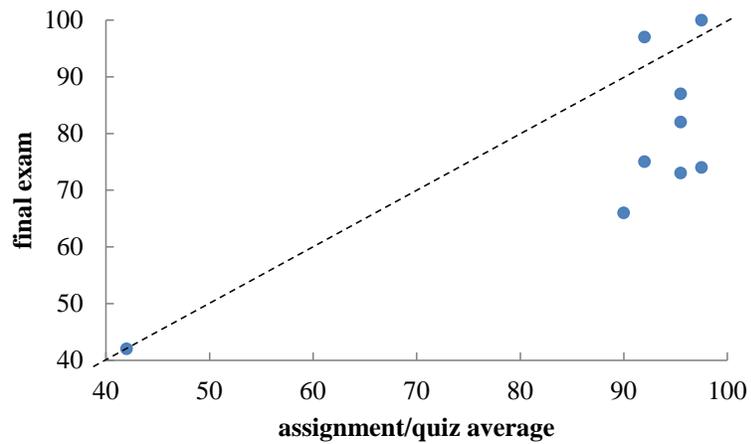
Figure 3: Scatter plots of grades for final exam and average grades for assignment 9 and quiz 5 (fundamental analysis)

CME Group Commodity Trading Challenge

As previously explained, the trading competition that students joined in the beginning of the semester was not initially planned to be part of the course. However, given the strong interest among students, I thought I could use as a learning experience in how commodity markets work. In the competition each team was given a fake account with $100,000 to trade for two weeks. **Figure 4** shows the account balance at the end of each trading day during the competition (AECN 399ers and Jama Kyss are the names of the two teams formed in the class). Both teams lost money in the competition and performed generally below the average of all teams in the competition.

Figure 4: Daily account balance of student teams in the CME Group Commodity Trading Challenge (in US$)
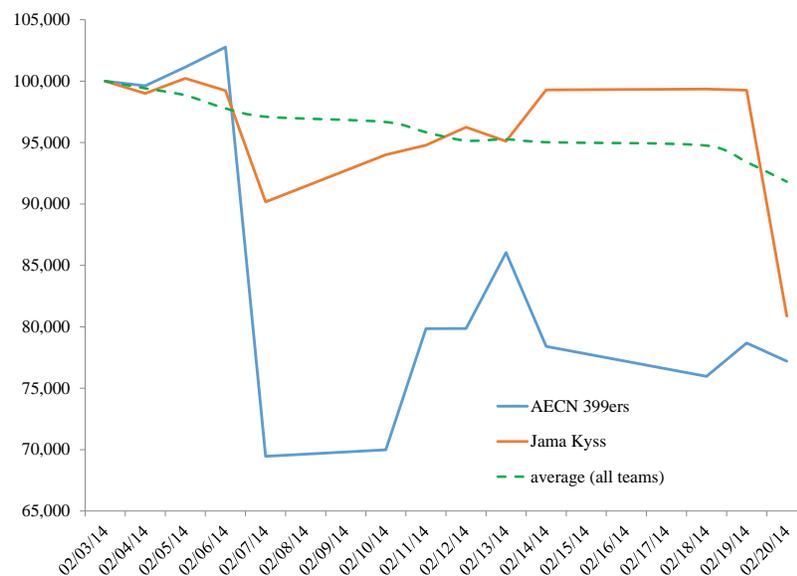
But as I stated before, their financial performance was not important. I wanted them to learn how hard it can be to anticipate commodity price changes. In assignments 3 and 5 I asked them to explain their strategies and discuss how they were trying to forecast price movements (I just wanted them to have a reasonable strategy, regardless what it was). Then in assignment 10 I asked them to reflect about the CME challenge and discuss what they learned. Their answers suggest that this competition was a valuable experience. The passage below shows how student 6 evaluated his performance in the competition, identifying what he could (or should) have done differently and how he would prepare if he were to participate in this competition again. All other students made qualitatively similar evaluations (which can be seen in the appendix), suggesting they all took advantage of the competition and learned important lessons about markets.

> *"Looking back on what we did during the Trading Challenge, one thing that we did wrong, was that we focused on mostly one technical indicator. We tended to focus on using stochastics as our main indicator to buy or sell. Looking back, this was definitely a bad way to determine our trades using it as our only technique. Stochastics show what the price is now compared to the range of prices that the market reached in a set period*

of subsequent time. While this info is useful, it is not a good indicator to use by itself. We also really didn't pay attention to any fundamental factors. Some days, there would be new information coming out and we would not know about it. This new information would affect prices and we were not sure why. One of the things that I might consider something that we did right, was that we diversified our trades when we weren't sure which way the market was going. There were many days which the market did not show any bullish or bearish trends, but we knew that we had to make trades. To make sure that the market wouldn't completely go against us, we would trade various commodities and have a variety of longs and shorts, based on which way we thought each commodity might go. If the Trading Challenge started next week, I would definitely use a wider variety of technicals. By using different technicals, we would be able to see if multiple technicals showed a true buy/sell signal or if there was a false a signal, the others would be able to show me that it was not a true buy or sell signal. Another price analysis I would do differently would be to pay attention to fundamentals. I would mark on a calendar each day a report was coming out that might affect that specific commodity. I would then be able to determine if I should stay in if it's a minor report, or if I should get out if it's a major report. Also, by knowing when new fundamentals come out, I could use changes in fundamentals to determine how much a price should change (using somewhat of regression like in class)."

Student self-assessment

Finally, also in assignment 10 I asked students how they would do their own price analysis after the course, whether they would have a preference towards technical or fundamental analysis and the reason for this preference. My main purpose with this question was to assess whether they understood the advantages and limitations of each method, that each method may be more useful for specific market conditions and that they can complement each other. Overall they appear to have gathered this understanding during the course, as can be seen in the passage below from student 8 (answers from other students are presented in the appendix).

"When doing my own price analysis I like to use both fundamental and technical analysis. Individually I do not think fundamental or technical analysis is a complete

way of looking at the commodity markets. I think parts of each need to be used to get a better understanding of how the markets will move. As I mentioned in question 2 both methods have advantages and disadvantages to using them and that is why I like to use both methods in trading. Market conditions that I believe make fundamental slightly more useful than technical would be the times during harvest when trying to figure out production numbers and the times during planting when planting progress and acres can make some serious moves in the futures market for grains. So during those times, that is when I believe fundamental is slightly more important to pay attention to than technical during those times. Favoring fundamental more than technical would be for short term trading knowing that the market will be more volatile to new grain news coming from the WASDE and other government reports. If I was reporting long-run forecasts for a big grain company I would use a lot of fundamental and technical analysis to make a balanced report that could be supported from several different aspects. If I were trading commodity contracts the amount of technical analysis would vary depending on how I was trading my commodity. It would depending greatly on how long term/short term my trading would be. If I was trading more short term, more technical analysis of past data and indicators would be used to make my opinions. My livestock and grain analysis would be similar but obviously would have to be slightly adjusted to take in the greater amount of factors that comes along with livestock analysis."

Planned Changes

I developed this course last year to be taught for the first time in the spring of 2014. So this was the first time I taught this course and also the first time the course was taught in my department. Therefore, to some extent, many parts and dimensions of the course were being "tested" during the semester. After reflecting on the whole course I thought of several potential points that can be changed for next year. I also consulted the students about some points that I consider changing for next year. I used an anonymous survey in the last week of class to ask them specific questions about the course. They also completed the standard course evaluation form, but I wanted to use my own survey to be able to get feedback on particular points that are not addressed in the standard evaluation.

Before I discuss these points, I will show the results of the survey with students. My last-week survey had multiple-choice questions, except for the last one where I asked for other comments and suggestions. In items listed below I list the points I asked the students in the multiple-choice questions and comment on their answers.

(a) course schedule: no clear preference between twice or three times a week (**Table 6**)

(b) online or standard classroom setting: all students prefer the classroom setting (**Table 7**)

(c) CME Group Commodity Trading Challenge: all students appear to have enjoyed the experience, but they were divided on whether it should be part of the course or not (**Table 8**)

(d) balance between technical and fundamental analysis: 4 students wanted to see more fundamental analysis in the current course format, while 3 students wanted to have one course only for technical analysis and another one only for fundamental analysis (**Table 9**)

(e) utilization of the upcoming commodity trading room: the majority of the students would like to combine some lectures in the classroom with some lectures in the trading room (**Table 10**)

Table 6: Answers to the question "What do you think about the course schedule?"

Choices	Number of answers
Twice a week (75-minute lectures on Tuesdays and Thursdays) is good.	2
I'd prefer three times a week (50-minute lectures on Mondays, Wednesdays and Fridays.	2
It doesn't matter; either twice or three times a week is fine.	5

Table 7: Answers to the question "If you could choose between taking this course online or in a traditional classroom setting, what would you prefer?"

Choices	Number of answers
Online	0
Traditional classroom setting	9
Not sure	0

Table 8: Answers to the question "Earlier in the semester you participated in the CME Group Commodity Challenge. In your opinion:"

Choices	Number of answers
It was a good experience and it should continue being part of the course.	5
It was a good experience, but it shouldn't be part of the course.	0
It was a good experience, but I'm not sure whether it should be part of the course or not.	4
It was not a good experience and it shouldn't be part of the course.	0
It was not a good experience, but it could be part of the course in a different format.	0

Table 9: Answers to the question "The course covered both technical and fundamental analysis, so there is not a lot of time to discuss specific topics. What do you think about the balance between technical and fundamental analysis?"

Choices	Number of answers
The balance between technical and fundamental analysis was about right.	2
I'd like to see more technical analysis.	0
I'd like to see more fundamental analysis.	4
I think there should be two courses, one only for technical analysis and one only for fundamental analysis.	3

Table 10: Answers to the question "We are developing a 'commodity trading room' which will essentially be a computer lab equipped with real-time commodity prices, market and financial information in general, trading software, and historical datasets. The purpose of the room is to provide hands-on experience in commodity price analysis, as students will be able to access real-time information, perform technical analysis and use statistical software to analyze data collected from the historical datasets. As you can imagine, the lab is supposed to be an important part of this course in the future. How do you think the course should use the commodity trading room?"

Choices	Number of answers
The course should be entirely taught in the trading room.	2
The course should be taught in a regular classroom and offer extra sessions (in addition to regular lectures) in the trading room.	1
I prefer a blended format, with some lectures taught in a regular classroom and others in the trading room.	6

In the last question of the last-week survey I asked students to provide other comments or suggestions that they might have. This question was answered by 7 students, who mostly expanded a little bit on the answers that they gave to the previous questions. But 2 students provided new suggestions, which are transcribed below:

"Offer more insight to actually prices real time while incorporating the material. Take time to assess CME challenge investment ideas and trading analysis."

"Giving more time to make presentations. Also, maybe use examples at real-time data to help us stay on top of current prices, maybe go over new information that came out since last class."

Based on my reflections and student's feedback, I am considering some changes for next year. One of them relates to the CME Group Commodity Trading Challenge. Since I did not expect that all the students would be interested in participating this year, I was not properly prepared to incorporate it into the course. Next year I will think more carefully about how to take better advantage of the competition in the course and use it more effectively to help students learn how markets work and how they can use technical and fundamental analysis.

Another change I should make is based on the extra suggestions cited above. Incorporating more discussions on current events in commodity markets will be valuable for the students to understand the material and relate to what they are learning. I have actually done some discussions on current events this year, but I now agree that I should do more of that. A

better plan to integrate this competition into the course would also be useful in addressing another idea (also in line with students' feedback), which is to spend a bit more time discussing fundamental analysis. The last-minute decision to incorporate the competition this year ended up taking a bit of time that I would spend with fundamental analysis. So another change I will make next year is to dedicate an extra couple of weeks to fundamental analysis, but without reducing the time spent on technical analysis.

An important part of the course next year will be the new commodity trading room. The Department of Agricultural Economics is creating a computer lab that will allow us to follow commodity markets in real time and also run price simulations in commodity markets. This will be an invaluable addition to this course, since it will allow students to apply what they learn in class to real-word, real-time markets. This also complements my previous idea of adding more discussions on current events in the course. The lab should be ready to use in the fall of 2014, which will be in time for the next session of this course to be offered in the spring of 2015.

One idea that I am still debating with myself is whether to keep offering the course twice a week (Tuesdays and Thursdays) or changing to three times a week (Mondays, Wednesday and Fridays). I feel that offering the class three times a week could help keep students more engaged, since we would meet more frequently. In addition, there would not be too much time between lectures (from Thursday to Tuesday), which could be beneficial as ideas discussed in the previous lecture would still be "fresh" in students' minds.

Finally, my question to the students about offering the course online was more out of curiosity than an actual intention of pursuing an online section. So this is not something I am considering at this point.

Summary and Overall Assessment of Portfolio Process

I start the last part of this portfolio by recalling that my overall objective with this peer review teaching program was to become a better teacher and improve my course. The opportunity to join a group of colleagues with the same overall objectives was invaluable. My peers who participated in the program with me and the program facilitators made several useful comments and suggestions to my course and teaching style. The whole group participated in discussions that generated ideas that helped me during the course and provided insights for further thought.

Although there is always room for further improvement, I feel I was able to improve as a teacher by paying closer attention to certain details in the preparation of lectures and course material, as well as by learning new teaching methods. As a general example, I learned to think more systematically about how to establish course objectives and then develop activities to meet those objectives, create tools to assess how much students learned, and reflect how to use this assessment to enhance student learning. The idea of asking students to reflect about the course and write their opinions about several dimensions of the material taught during the semester came from a discussion in this program, and it was very important for me to read what their thoughts and better understand what and how they have learned.

Additionally, my last-week survey asking for student feedback on specific points also emerged from a conversation in this program. Some of the feedback actually surprised me, and provided relevant insights. For example, when I asked whether they preferred the course to be offered in the traditional classroom setting or online (they could also say "not sure"), I was just curious about their preferences and had no plans to change the course to an online platform. However, I did not expect that all students would indicate preference for the traditional classroom setting.

With respect the course, I cannot compare it with previous years because this is the first time it is taught. But I can tell that this experience also helped me reflect on other courses that I teach. As a result, I already have some ideas to improve other courses and will put them in practice the next time I teach them.

Appendices

The passages below show samples of student work following the discussion in "Analysis of student learning". These excerpts come from students whose work was not directly quoted before. The headings indicate the sub-sections where the samples are discussed in the main text. Finally, the subsequent pages present a copy of the course syllabus.

Evaluation of student work

Student 3:   [Assignment 4] "I think in the next two weeks prices for live cattle will at relativity the same with the exception of no major news coming to the market I think this because there isn't any major time in the live cattle market like when all of the fall-weaned calves are becoming finished and there isn't a huge flow of market ready cattle coming to the market. Like I said before there is a very positive mood in the live cattle market as many feedlot are making money now after suffering months and months of losses last year. I don't think the market will go on a long uptrend but I also don't think it will go on a downtrend thus leaving the market somewhat steady for the next two weeks if no major information comes to the market."

[Assignment 8] "I think in the next few week the market will act much in the same way as it has been the last month or two. Staying between the 135 and 139 range. I think the strong uptrend that this market was on previously is now over but I don't think that this market will get on a downtrend and retreat back to October of 13 or December of 13 prices. I think this market will continue this sideways trend that it has been on for a month and a half to two months in the next two weeks. All of these predictions are made suspecting there will be no new major news coming out within the next two weeks."

Student 4:   [Assignment 4] "Overall, I think the futures price will go up in the week of February 17-21. The candlestick chart from February 3rd to February 14th shows an upper trend. Buyers are putting money in to bid up the price. The volume was

about 200,000 contracts per day during February 3rd and February 14th. There are enough buyers and sellers that believe market movement was reasonable during those days. Sellers tried to bid down the price, but the overall price still has an upper trend. On February 12th, open price, low price and close price were very close, and the trading volume is about 200,000 contracts. This gives a signal that the market is going to reverse. On February 13th and 14th, corn futures price increased. Especially on February 14th, the buyers showed a stronger buying power compare to the previous week. Therefore, I think March corn futures price will go up during the week of February 17-21."

[Assignment 8] "According to the analysis above, I think the uptrend beginning from January 2014 is losing the strength because RSI was declined to 55.43, MACD(12,26) was below the SMA(9) and Slow Stochastic oscillator was below Fast Stochastic oscillator. So, market might be going to reverse in the next couple of weeks."

Student 5:   [Assignment 4] "Looking ahead at this market for the week Feb 17-21 I would still expect the market to be higher but possibly nearing resistance. In the more recent days we have seen more pressure from the sellers, this may be an indication that the trend is losing momentum and could begin to turn."

[Assignment 8] "In the following weeks I would expect a pullback of some sorts. I would expect a retracement possibly to the $14.60 ish level where the market has had resistance and then support before or possibly lower to one of the lower levels in the 13.75-14.25 range. I personally do not think the market will go below $14.00. The stochastic have crossed signaling a downward movement, and the RSI and MACD are both near the neutral ground as would be appropriate in a retracement. We may see the market level off and begin trading in a sideways trend as we move into summer and talks of cancelled cargo's and increased imports linger in the market."

Student 6:   [Assignment 4] "Without a whole lot of news in the near future coming out, I don't see the market moving around too much this next week. It kind of looks like the market is trying to stick between the $4.36 and $4.50 range. It seems that the buyers are trying to keep slowly pushing the market up with funds behind their purchases, but I don't think that the sellers will let market go past $4.50 and they'll continue to sell to keep the market in that range. Part of the reason I think this, is that once the market hits $4.50, that's a point where a lot of hedgers will feel more comfortable selling at (From talking to my dad and other farmers). If we get into that price area, I believe we could see a lot more new money from hedgers coming in and selling and bringing the market back down below 4.50. I also don't think that the buyers will back off in the upcoming week and let the market get below $4.36. Of course, this is just my opinion and I could be completely wrong."

[Assignment 8] "Based on my discussions from earlier, I believe the market will continue to rise in the next couple of weeks. Nearly all of the indicators showed that the market will continue to rise. However, the stochastic did show the K crossing the D from above, so I could maybe see the price drop for some time, but overall, I think the price will go up in the next couple weeks based on all of the other indicators."

Student 7:   [Assignment 4] "My prediction is that the market price for corn will continue to go up in the month of February (March board). As I stated earlier, the 25-day moving average passing the 100-day moving average (from below) is significant. It indicates that the market price will continue to increase. Also, buyers have shown that they have primarily had more power over the previous 12 days than sellers. There has been several times that sellers pushed the price down below the open, but buyers were able to raise it back up to end higher than the open. All in all, it appears that the price will continue to go up (in very small amount)."

[Assignment 8] "After looking at all the indicators, I believe that prices will continue to move at a near flat rate for the next couple of weeks, with perhaps

a slight upward movement. Most of the indicators have shown that the upward trend that has been occurring (started in February) is slowing down, and that there is evidence that a trading range, or sideways trend will likely occur. However, only time will tell the true story."

Student 8:   [Assignment 4] "My forecast I see the prices with low trade ranges around the $4.50 range because I believe that is a big sell price for a lot of corn. Hard resistance at that level, I am evaluating that from previous experience. I can see some wide trade ranges in the next week with some possible retreating of the price after it tries to find some new price levels. I believe that because of the evidence we saw in the last two weeks. The market is trying to find a new price and without any new fresh fundamental data on the news line they technicals will have to continue to find the new right price as the open interest and volume continues to dwindle as we approach the time to roll into the May contracts."

[Assignment 8] "From looking at what I discussed here recently with the study of these trends I still believe in a sideways trade as May continues. With several indicators around the 475 mark I believe that will develop a strong support line with a resistance line developing around 490ish again. With the last breakthrough that level I believe that the trade will retract back below that level. 5.00 will be the top part of the resistance zone. Going into May without any new fundamental data to sway the trade I believe the corn to be trading around 4.80."

CME Group Trading Challenge

Student 1: "What we did right: I believe that we were very attentive to the market and made daily trade requirements successfully. This helped to ensure we did not get docked for not ma king the required amount of trades. We were also able to focus on upcoming reports and form opinions on how we felt the market would react to our estimate of ending stocks, disappearance, etc. This is a good practice of fundamental analysis. We also did some technical analysis using methods we felt comfortable with. These analyses helped estimate what direction the market was going. What we did wrong: There were quite a few things, in hindsight, that we did wrong or could have done a lot better. We only used a few studies to analyze prices from a technical stand poi nt. We could have easily used more moving average, volume, candlestick, Bollinger band, and stochastic charts to analyze prices. I t helped to use some, but using multiple analyses would have been much more beneficial and indicative of prices. I believe we were also wrong in only making inter-day trades. There were very few times we made trades that were not offset within a day or two. This did not show confidence in our decisions and does not help combat unforeseen changes in the market away from the expected result short term. If I were to do the CME challenge again, I would do it much different. I would assess each commodity and do a market outlook like we have done for live cattle, corn, and soybeans on both a fundamental and technical basis. I would identify which commodities have the most volatility, chance of continuing their trend, or will have a report come out within the duration of the challenge. These would be the commodities to invest in right away or the first couple days of week 1. The rest would be viewed and traded daily to make requirements. This would be the basic start to the challenge. The commodities could be reassessed going into week two and the outlook may have changed so that different commodities could be invested in or currently invested in commodities could be offset."

Student 2: "In the CME challenge, I feel that we did a nice job of applying what we learned in terms of fundamental analysis and technical analysis. I personally did more of a

fundamental approach since this was the material we had covered already and I was more comfortable doing this. The price analysis that I came up with made my decision easier for me. Although we were not always right, we gained some valuable experience in a very life-like simulation. Learning from our mistakes and experiencing the mistakes will help us all make better decisions in the future. I personally feel that I made a couple mistakes in technical analysis in calculating the correct numbers and reading what those numbers were actually telling me. Doing these wrong helped me though. By experiencing a screw up I am able to learn from that and not make the same mistakes in the future. If we could do the CME challenge all over again, I would use more of combination of fundamental analysis as well as technical analysis. I would use many different ways to determine prices and my price analysis to try and recognize the trends and make better price assumptions for future prices."

Student 3: "In the CME Trading Challenge I did very little trading during the actual trading competition. I think I did this because I didn't really know much about fundamental or even technical analysis and the little bit I did know I didn't want to put it to test in a group competition. The trading that I did do though was based off of fundamental analysis just because that's what I knew the most about and could really back my trading moves with solid evidence. Although I could back my trading with confidence I still was confident in my trading abilities and decision-making. If I were to do it again today I would go through both fundamental and technical analysis of just a few commodities and then base all of my decision making off of those factors. Now that I know much more about both technical and fundamental analysis I would enjoy doing something like the CME Trading Challenge to put what I learned to a test before using my own money trading based off of technical and fundamental analysis."

Student 4: "The mistake I made during the competition was that I only trade few times and I did not combine different indicators to predict market movement. In most of

times, I used simple moving average to identify the market movement. This sometimes gave me wrong information. I think I did right on checking daily charts multiple times during the day and used the technical analysis to predict market movement. I did listened to some analyst on the internet daily to gain overall market information. Additionally, I used trend line technique to indicate how the market moved in the long run but this did not work well because our competition only last about 2 weeks. The competition period was not long enough to indicate a long-term trend. If the CME Trading Challenge were to start next week, then I would start to listen to agricultural news and be familiar with CQG trading software. I would use more indicators to help me to predict price movement. I would write down each indicator we taught in this class in a notebook and with their implications so I would have better understanding. I would compare the information from each indicator. If most indicators tell similar stories, then it helps me to confirm the market moving. Most important point is that our team members need to discuss the market together everyday and discuss what we going to do in the next day."

Student 5: "The CME trading challenge was definitely a learning experience. At the time most of the price analysis techniques were fairly new to me, and the idea of opening and closing positions within a day was definitely different. During the challenge I believe that I did well in recognizing resistance and support levels, which we could trade off of. Although I saw some the reversal signals being able to know when/if they would be false was difficult given the limited scope of indicators and other fundamental factor awareness I had at that time. The biggest problem I had with the challenge was getting the group to all be on the same page. In a challenge like that I believe you need to have larger trades and actually use your money but the risk was not worth it to some members. Additionally I wanted to stick with the commodities we were familiar with even if there were higher possible returns in other ones, I lost this argument although it was never really discussed and we lost a lot of money in oil. After that I pretty much lost interest in the challenge. I think my biggest fault in the challenge was not completely

understanding how all the indicators work and which ones would be most useful for what I was trying to figure out. I placed a lot of trust in one or two indicators and didn't really look for confirmation from the others. If the challenge were to start again next week I would definitely enter more prepared I would do analysis before to see what indicators seem to be most accurate for given markets and would do more reading on what is happening from the fundamental side as well. In trading I would use several additional indicators to before for confirmation as well as probably going with a more short term strategy I would look for days to trade rather than trying to think about the next month."

Student 7: "The CME was a new and interesting challenge for our entire group. During the challenge, our group lost quite a bit of money (mostly due to risky last-day trades trying to move up the leaderboards to qualify for the second round). However, in all we did some things well, and we did some things poorly. To begin with, I believe our group did a good job of keeping up to date on fundamental information. Each one of us was fairly familiar with what was going on in the supply and demand side of the market, particularly in the grain commodities side of things. Next, I believe that we did a good job of picking a position that we thought the market was going to go during a day, and sticking with it to earn a profit. Our group did have some struggles during the challenge, though. To begin with, our busy schedules made it difficult for us to get on and make trades during the day, which actually cost us a couple of fines due to not trading on a couple days. Next, we had the most familiarity with the grain commodities, and not so much with the other commodities. This cost us when we accidentally traded a contract that wasn't part of the challenge, and cost us a hefty fine. All in all, we felt that the CME challenge was a great experience, and we would each take the opportunity to do it again if we could. I think that if I were to prepare for the CME challenge as if it were next week, I would formulate a strategy to incorporate both fundamental and technical analysis in my proceedings. To begin with on the fundamental side, I would pay attention to the USDA number, such as exports, ethanol production, weather, plantings, and so on. Furthermore, I would

keep up to date on topics such as the Ukrainian situation and South American production. All of these factors can have impacts on a day-to- day basis. On the technical side of things, I would use the indicators, particular ly the SMA's and MACD, with some possible use of Bollinger Bands and the RSI, to determine what I thought the market was going to do on a day-to-day basis. Finally I would try to read as much market commentary as I could to get some outside advice on possible marketing happenings. As a side note, I would probably focus primarily on day-to-day trading, rather than try to trade intra-day, and I also would focus primarily on grain commodities, due to the fact that I am the most familiar with them."

Student 8: "Some things I believe that I did correctly was my analysis of fundamental data that was being released during the challenge. I was able to analyze what numbers were already out and make quick decisions if the market response was going to be bullish or bearish for the next few days of trade. Also I had to determine how far the price movements would go after the newly digested information. I would take that information and try to balance it with some short and long term technical analysis I was seeing. In the volatile soybean market I had several long term support and resistance lines that I followed and analyzed a long term trend. Then for short inter day trading I used short term support and resistance levels using both charts and the interface of the program we used to see where heavy buy and sell orders were coming in. These combinations of strategies worked really well as we made money on about 95% of the trades using them. Lost money trades were almost always wrong assumptions on new reports coming out or some form of penalty for not trading enough or trading a wrong commodity. Those penalties held us back and caused us not get in the final round. One day before our trading closed we decided to make some huge bets on the natural gas report coming out but unfortunately we were incorrect on our assumptions and lost quite a bit of money. That opinion at the end was just a big attempt to try and qualify for the next round. If I were to start the challenge again next week I would start by doing some fundamental research. After deciding what commodities to focus on I would

run a stock to use analysis that has been adjusted for inflation to see how some prices have been compared to where we are at in the grain marketing year. I would compare those values with our current values according to our WASDE report. Then using some moving averages and some StochRSI technical indicators to get some confirmations on trends right now and some confirmations on some future price movements. As the challenge would start I would use any information that I gathered from the analysis and use it and compare with the short term inter day trading again. Using a combination of these fundamental and technical analysis going into the challenge would give me more of an advantage of what to expect in the futures market and greater prepare to make quicker decisions. I can only assume with those preparations I would probably turn that 100,000 into l5OK maybe 200K."

Student 9:   "In the CME challenge my group focused too much on making day trades and less at taking positions over a period of multiple days. When we took this approach we were not able to look at a longer term market and would often trade out of a position too quickly if things were going the wrong way instead of possibly riding the market for a longer term. Vice versa when we wanted to make a trade that would span multiple days we would often get out of a position too early because of a downward movement and miss out on an uptrend that happened later down the road. It's easy to look back at that now and say what we should have done so I guess we made the best decisions at the time. We needed to balance our analysis between fundamental and technical more but it was hard to notice many technical trends in the brief period we traded. We would spend more time thinking about each trade instead of making trades just to do so. Often times we made trades just to get our required amount of trades and that is not a good strategy. Now that we know a lot more about technical analysis we could make better decisions and we would do more research on both the technical and fundamental sides of things. It also would have also been a good idea to trade more than just the basic commodities such as corn and soybeans."

Student self-assessment

Student 1: "If I did my own analysis, I would not rely exclusively on either technical or fundamental analysis. I believe they both serve a purpose and should be used together. I do not think that either could be called the "complete method" to analyzing markets. I believe that in certain times of crisis, war, economic decline, etc. that the fundamental analysis should be more closely followed than the technical analysis. For long run forecasts, I would use more technical analysis to be able to accurately pinpoint where prices should be or are going. Fundamentals may be more indicative of where the market is right now and why they are where they are. The kind of market would also make a difference in what analysis I would use. Assessing market price for corn would be much different that assessing price for live cattle. They are completely different markets and have different affects on each other. Technical analysis can be used for both, but I would use much more fundamental analysis for live cattle than I would for corn. The change in fundamental figures can have a large effect on cattle like we have seen in recent months. Cattle also take much longer to adjust to prices so it is in the fundamentals that information can be seen and assessed as the supply chain reacts to changes, thus affecting price. It could be that the fundamentals could be used to foresee change while the technical analysis could be used to identify and assess trends within long term trend seen by the fundamental analysis."

Student 2: "I prefer to use fundamental analysis more than technical analysis. A combination of both is what I would personally use with a stronger preference on the fundamental side. I do not consider either analysis a complete method and both should be used to make the most educated decision as possible. Market conditions such as weather patterns and trade patterns of world countries that affect imports and exports would sway me to favor fundamental analysis. If I were making decisions for a big company that would potentially affect large amounts of gains or losses I would use a combination of the two analyses to make the educated decision that I could. Using knowledge provided by both would make me more

comfortable in my decision and make my chances of failing go down. Nothing can perfectly predict what prices will do but being as informed as possible can't hurt anything."

Student 3: "When doing my own price analysis now I use a mixture of both but previously any price analysis was all based off of only fundamental analysis. I think personally I still tend to lean more to the fundamental analysis side when trading only because that is what I know the most about but the more analysis that I do of charts the more and more technical analysis I will use. I don't really think either are complete methods but the two methods together are closer to complete although I still wouldn't call the two methods together complete."

Student 4: "Personally, I would use fundamental analysis and technical analysis together to predict market movement. Supply and demand is the fundamental factor to determent what price should be. Fundamental analysis could give us an overview of the market movement in the long-term, but technical analysis gives us price moving in detail which could help us to decide when to make the decision. I do not consider either technical analysis or fundamental analysis as a "complete method" to analyze markets. Fundamental analysis use supply and demand information to analyze market. On the other hand, technical analysis use past market price data to look for repeating patterns assumes the trends will continue. Fundamental analysis gives us an overall view of market movement in long-term period. Technical analysis gives us a detail of the market price movement in the past. I will favor technical analysis over fundamental analysis when I making the decision to sell or buy futures contract. Additionally, if I am a short-term trader, then, I will favor in technical analysis. In other hand, if I am trading in long-term, then, I will favor in fundamental analysis. I would not use the same approach if I were trading commodity futures contracts or if I were preparing long-run forecasts for a big grain company. I would use technical analysis if I were trading commodity futures contracts, but would use fundamental analysis if I were

preparing long-run forecasts for a big grain company. I would not use the same approach for grains and livestock. I would prefer to use fundamental analysis in livestock market. Livestock market is more complex than grain market because livestock. Livestock market is related to many others grain market such as corn, soybean, and soybean meal. So I would need to look at all these different markets to make the decision."

Student 5: "When doing my own price analysis I tend to rely more on fundamental analysis as I tend to think long-term for the entire crop year. I do however use technical analysis for the timing and confirmation of my opinions. For example if I am thinking the market needs to adjust lower after the crop report I may look at the technical for nearby support zones to give me an idea of how drastic the change may be and if action is needed for price protection. I tend to look at technical a lot more when contemplating options. I like to see if there are any support/resistance zones that will hold my position out of the money and to get a sense of how much risk I may be assuming if I am selling the options. I do think that technical analysis is more useful if you are using the futures to strictly hedge your position such as for grain elevators and the like. I think grain and livestock pretty similar in the sense that the fundamentals are better for longer term and the technical are more short term oriented."

Student 6: "I do not rely exclusively on technical or fundamental analysis and neither are a complete method. I tend to use technical analysis for only short-term trades. I do have a small speculator account set up that I make trades on every once in a while. Those trades will almost be done exclusively by technical analysis because my average trade length is only a day. Fundamentals only really matter to those trades because I try to not be in the market when big reports come out, to try to reduce risk. If I were making long term trades, I would rely a lot more heavily on fundamental analysis. l would use government reports and other information (weather, political issues, etc.) to determine where I think the market should be

going. I would still use technicals in this instance though. I would use them to determine a good "striking point". If I think the market will go up due to fundamentals, but the technicals show a downtrend, l will probably wait to go long until the technicals start to show a bullish trend. Obviously neither are complete trades, but sometimes one is favored more than the other depending on the situation. In terms of using different approaches for grain or livestock, I wouldn't use different approaches. Obviously there are different factors involved with each market that I would need to watch for, but I wouldn't really treat them differently in terms of trading strategy."

Student 7: "Personally, I do not believe that one can use just technical or fundamental analysis alone. To have the best grasp on what the market is going to do, one should analyze both the fundamental and technical factors that are affecting the market, and use both to make a rational decision. On their own, I do not view either technical or fundamental analysis as a "complete" method of analysis, as both have their limitations. There are, however, certain market conditions that favor one type of analysis over another. For example, if I were trading commodity market futures, I would incorporate more technical analysis into my forecast. If I were preparing long-run forecasts for a big grain company, I would focus more so on the fundamental factors in the market. Additionally, I believe that I would use a similar approach for both grains and livestock, however there would be different factors (primarily on the fundamental side) that I would look at for each, such as plantings for grain, or feedlot, packer, and wholesaler prices for livestock."

Student 9: "If I had to use only one form of analysis I would use fundamental analysis as it has a more general picture of the market but neither technical or fundamental would be a complete method. As I said earlier fundamental analysis can give you a broad picture of the market and which way a trend might go but technical analysis can "fill in the gaps" of trading and be a good tool for short term trades. Technical analysis may be better in the short term but longer term forecasts would

be better to use fundamental analysis when making long term forecasts. With livestock there are more factors to take into consideration such as feed prices and time that it takes to get cattle to market."

Syllabus – Spring 2014

Organization of the course

Credits: 3.00 units

Prerequisites:

o ECON 212 (Princ. Microeconomics) or AECN 141 (Intro. Economics of Agriculture)

o ECON 215 (Statistics) or STAT 218 (Intro. Statistics)

Lectures: Tuesdays and Thursdays, 3:30pm - 4:45pm

Classroom: 210 Filley Hall

> *Note that the course is listed under the general title "Independent Study in Agricultural Economics". However, this is a regular course and not an "independent study". Our section is 006 and class number is 23619.*

Instructor information

Instructor:	Fabio Mattos	Email:	fmattos@unl.edu
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Webpage:	http://fabiomattos.weebly.com		

Office hours: I am usually in my office and you are welcome to come see me anytime. You can also set up an appointment by email.

Overview and motivation

Participants in commodity markets are constantly trying to forecast prices. A sound analysis of expected prices in the future is important in many dimensions. For example, it is useful for producers and merchandisers as they develop their marketing and risk management strategies during the crop year. It is also relevant to financial institutions providing loans to the agricultural industry as they assess financial performance and credit risk of their clients.

Another aspect of market analysis is the short-run trajectory that prices follow until they reach their long run forecast. This information is also important as it relates to the timing of decision-making in commodity markets. For example, it is relevant for producers and merchandisers not only to define a marketing or risk management strategy, but also to determine the best time to implement it.

Two methods have been widely used to forecast prices and their trajectories: fundamental analysis and technical analysis. Fundamental analysis focuses on economic data (such as production and consumption) to forecast prices, while technical analysis studies patterns in price data. Market participants have long debated which method is better, but it is as easy to find successful practitioners who rely on fundamental analysis as it is to find successful practitioners who use technical analysis. The purpose of this course is to discuss how fundamental and technical analysis have developed and are used in commodity market analysis, their strengths and weaknesses, and whether these methods can complement or substitute each other.

Course objectives

The overall objective of this course is to teach students how to analyze commodity markets using fundamental and technical approaches. The most common techniques from each approach will be discussed, focusing on how they can be implemented, their advantages and disadvantages, how they differ and how they can complement each other in commodity market analysis. At the completion of this course, students should be able to:

- have a thorough and workable knowledge of the forces that affect commodity markets

- apply different techniques in fundamental and technical analysis, along with critical thinking, to evaluate and solve real-world problems in commodity markets

- discuss and support their opinions using fundamental and technical tools

- appreciate the importance and complexity of fundamental and technical analysis in commodity markets and understand that nobody can consistently make accurate predictions about market movements

- realize that no technique is complete and unfailing

- understand that commodity markets are dynamic and different scenarios and circumstances require different approaches to analyze commodity prices

- realize that fundamental and technical tools are useful to organize their thoughts when analyzing commodity markets, and not a set of facts to memorize

- understand the consequences of decisions based on market forecasts and be mindful of those consequences in their professional activities

- recognize that market analysis is a combination of science and art; i.e. effective market analysis requires knowledge of scientific techniques as much as human judgment based on institutional understanding about markets

The figure below shows pairs of charts with daily prices (left) and their corresponding price changes (right) over time. Daily prices represent observed prices for a given asset, while price changes represent how much the price of the asset changed over one day. Two of the pairs come from actual assets and correspond to "real" prices. The other two pairs are fake prices generated by a computer. Which ones are real and which ones are fake? (This exercise was presented by Mandelbrot and Hudson in "The (mis)Behavior of Markets").
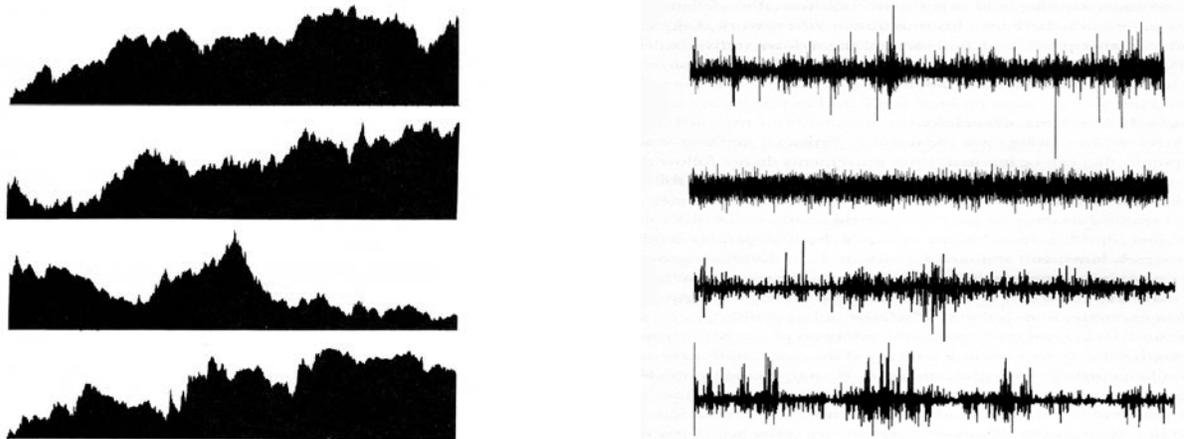
Course outline

(1) Introduction and motivation

- why market analysis is important and how it can be useful in commodity markets

(2) Basic concepts and philosophy of fundamental and technical analysis

- theoretical foundation of fundamental analysis: supply-demand framework

- theoretical foundation of technical analysis: price patterns

- overall similarities and differences between the two approaches

- economic theory and fundamental and technical analysis: random walks and efficient markets

> *"The most basic investment question is: Can the markets be beat? The efficient market hypothesis provides an unambiguous answer: No, unless you count those who are lucky." [Schwager, J.D., 2012, Market Sense and Nonsense: How the Markets Really Work (and How They Don't)]*
>
> *If the efficient market hypothesis is correct, should we still study fundamental and technical analysis?*

(3) Fundamental and technical analysis in practice

- Fundamental analysis
    - economic principles, supply and demand
    - the "old hand" approach
    - the balance sheet approach
    - the tabular and graphic approach
    - the regression approach
    - seasonality and cycles

- Technical analysis
    - trends
    - channels
    - chart patterns
    - supports and resistances
    - moving averages
    - oscillators and contrary opinion
    - trading volume and open interest

- Further discussion
    - Strengths and weaknesses
    - Are they complements or substitutes in market analysis?

    - Real-world examples and common mistakes
    - Is one method better than the other?

(4) The Commitment of Traders report

- how the report is developed and what it can really tell us

- how it can help us analyze commodity markets

Readings and course material

AECN 399 – Commodity Market Analysis

No textbook is required. Material covered in class will be based on several chapters of the books listed below, which are placed on reserve at the CYT Library (East Campus). Slides, lecture notes and handouts will be used to guide students through the topics and complement the material discussed in class.

Main references

- A complete guide to the futures markets: fundamental analysis, technical analysis, trading, spreads, and options / J.D. Schwager (John Wiley & Sons, 1984)

- Agricultural price analysis and forecasting / J.W. Goodwin (John Wiley & Sons, 1994)

- Technical analysis: the complete resource for financial market technicians / C.D. Kirkpatrick II and J.R. Dahlquist (FT Press, 2012)

  ### the library only has the study guide for this book, which is the one placed on reserve ###

- Technical Analysis of the Futures Markets / J.J. Murphy (New York Institute of Finance, 1986) *# not on reserve #*

Additional references

- Agricultural prices and commodity market analysis / J.N. Ferris (Michigan State University Press, 2005)

- Grain trading / R. Brock (Brock Associates, 2005)

- Trading commodities & financial futures: a step-by-step guide to mastering the markets / G. Kleinman (FT Press, 2005)

Finally, if you want to explore further material, you might want to check the following books (they are not available at UNL libraries).

- Agricultural futures and options: principles and strategies / W.D. Purcell and S.R. Koontz (Prentice Hall, 1999)

- Entries & exits: visits to sixteen trading rooms / A. Elder (John Wiley & Sons, 2006)

- The commitment of traders bible / S. Briese (John Wiley & Sons, 2008)

- The evolution of technical analysis: financial prediction from Babylonian tablets to Bloomberg terminals / A.W. Lo and J. Hasanhodzic (John Wiley & Sons, 2010)

- The heretics of finance: conversations with leading practitioners of technical analysis / A.W. Lo and J. Hasanhodzic (Bloomberg Press, 2009)

Evaluation

The final grade will be a weighted arithmetic average (see table) of all grades obtained during the semester in exams, assignments, quizzes and attendance. Requests to take a make-up exam, quiz or assignment must be approved <u>prior</u> to the scheduled exam or due date of the quiz or assignment. Missed exams, quizzes or assignments will be given a grade of zero unless documented health or family matters are provided within one week of the missed exam, quiz or assignment.

	Weight
Midterm exam	15%
Final Exam	15%
Quizzes	15%
Project assignments	50%
Attendance	5%
Total	100%

This chart shows March 1998 futures prices for soybeans. According to technical analysis, the price behavior observed in October and November 1997 characterized what is called a "head-and-shoulders top", indicating that price was going to decrease after that (without any consideration about supply and demand conditions). In other words, just by looking at this price chart and paying no attention to economic variables (such as supply and demand in the soybean market), technical analysts anticipated that futures prices for soybeans were going to decrease in December 1997. It seems to have worked in this example. But does it always work?

Soybeans (S) Mar '98
05-Jan-98 O 671.500 H 676.000 L 668.500 C 674.000 A 6.500
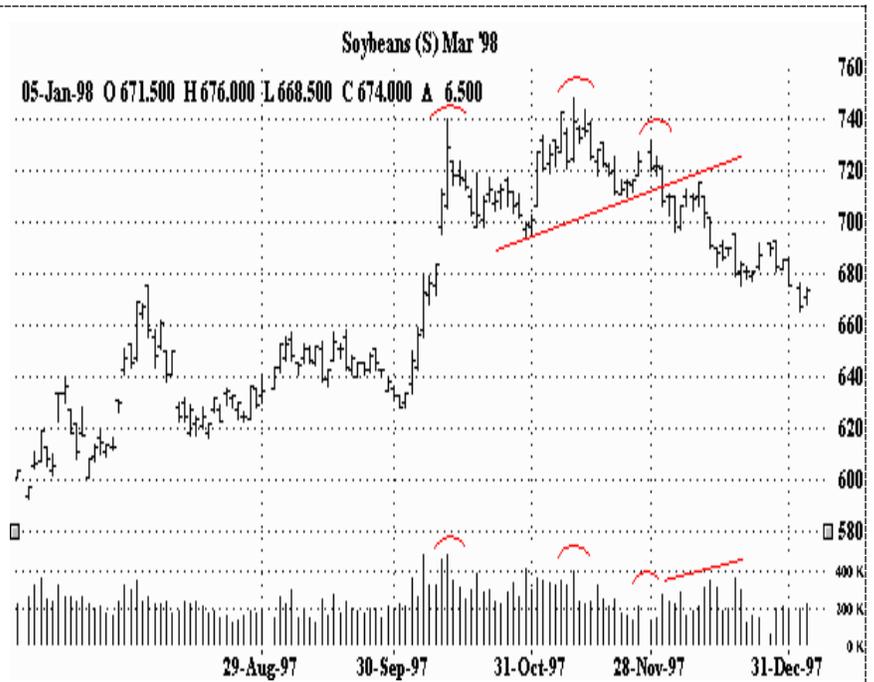
Academic integrity

Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty. Cheating in examinations or tests may take the form of copying from another student or bringing unauthorized materials into the exam room. Exam cheating can also include exam impersonation. A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty.

Students are expected to adhere to guidelines concerning academic dishonesty outlined in Section 4.2 of University's Student Code of Conduct (http://stuafs.unl.edu/ja/code/). Students are encouraged to contact the instructor for clarification of these guidelines if they have questions or concerns.