

AGRICULTURAL BUSINESS 415
Spring 2009

INSTRUCTOR: Kuo-Liang Matt. Chang
CLASS MEET: M 5:00-7:50 pm, Plumas 321
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OFFICE HOURS: M 12:10 pm to 2:30 pm, or by appointment
PREREQUISITES: ABUS 301 and MATH 105 or equivalents.

COURSE OBJECTIVES

The objectives of this course are to have students develop an understanding of:

1. price determining factors for agriculture products and their influence on agricultural prices;
2. economic theories and principles that can be applied in agricultural price analysis;
3. statistical methods that can be applied to the price analysis and forecasting.

TEXTBOOK

Goodwin, John W. "Agricultural Price Analysis and Forecasting" John Wiley & Sons, Inc. 1994, ISBN: 978-0471304470.

Readings from other sources may be assigned as well as class handouts.

TENTATIVE COURSE OUTLINE

- I. Price Analysis: Introduction to mathematical applications
 - Introduction to Agricultural Price Analysis
 - Price Determination vs. Price Discovery
 - Correcting for Inflation—Index Numbers
 - Time Trends
- II. Regression model specification and estimation;
 - Statistical applications to demand estimations
 - Model development, data assessment, evaluation of results
 - Coefficients, t -values, R^2 , F values, Dummy variables, functional form
 - Elasticity estimates and price forecasts
- III. Supply and Demand Relationships in agriculture
 - Demand Relationships
 - Marketing Margins
 - Supply Relationships
- IV. Price Determination and Market Structure: Industrial Organization

- Perfect Competition
- Monopoly and Monopsony
- Oligopoly and Oligopsony

GRADING

A final course grade will be assigned based upon your performance on the following items in the table below. A letter grade is determined by the total number of points accumulated during the semester. Points are assigned as follows:

	<u>Percent of Final Grade</u>
Three Quizzes	30% (each worth 10%)
Research Project	35%
Class Participation/Discussion	15%
Homework	20%

No make-up quizzes will be offered. No late homework will be accepted.

RESEARCH PROJECT

The term research project is due December 10 at the beginning of class. Late papers receive a 10 points reduction per day. Please see the ‘Commodity Price Analysis Project’ handout for detail.

ACADEMIC HONESTY

Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for the respect of others’ academic endeavors. Students who violate these standards (e.g., cheating and plagiarism) will be confronted and accept the consequences of their actions. The university’s policies on academic dishonesty will be strictly enforced. It is the student’s responsibility to know and understand the CSUC Academic Honesty Policy. The university’s policy is provided in their catalog as well as via its web site. Ignorance of university policies and to what constitutes academic dishonesty are not acceptable excuses in this matter. If there is evidence that the student has been involved in any form of academic dishonesty, the student(s) will receive an “F” grade for the course, and a report will be provided to Student Judicial Affairs for further action.

Notes:

1. This syllabus is subject to change.
2. If you need any special assistance regarding to your study, health, and other reasons, please do not hesitate to contact me as soon as possible.

Agricultural Business 415

Commodity Price Analysis Project

Focus of Research Project

Analyze price behavior for an agricultural commodity of your choice.

Using statistical techniques and the knowledge you soon will learn in this class, your goal is to determine the impact that various economic factors have on the demand or supply for your chosen commodity.

With the results of your analysis, you will (1) predict future prices for your commodity under various conditions, and (2) predict (quantity) demand sensitivity of your product to price changes (you will estimate elasticity). The result of your analysis will be presented in a written research report and a 15-minute, in-class presentation.

Commodity Selection

The commodity you choose should be one that is dictated by consumer demand (e.g., almonds, rice, apples, etc.). This product should not be an intermediate product used as an input for some production process (e.g., hay, fertilizer).

Data Sources

There are many sources of information which will save you time in searching for the necessary statistical series and background material. Richard Soares, the Agricultural and Natural Sciences Reference Librarian at Meriam Library, can assist you in guiding you through the maze of information at the library (his email address is: rsoares@csuchico.edu). Meriam library also offers many online links for you to search for useful information. For example, try the link listed below as a starting point.

<http://www.csuchico.edu/lref/guides/rbs/ag.htm>

Besides working online, most of the time it is faster to go to the library and use these sources directly:

- USDA Agricultural Statistics Service (also see: <http://www.nass.usda.gov/index.asp>)
- USDA Agricultural Situation Report (quarterly)
- Survey of Current Business
- Statistical Abstract of the US
- USDA Agricultural Prices
- California Agricultural Statistics
- USDA Food Expenditures, Consumption and Prices

You may also consider contacting the ERS (Economic Research Service of the USDA) who has offices that specialize in various agricultural commodity groups. Go to www.usda.gov and look for the latest "Situation Outlook" publication on your commodity.

Data Collection

You are expected to, but not limit to, collect the data listed below and enter it on an Excel spreadsheet in columnar form. You can choose to obtain either cross-sectional or panel data set for this paper. The data set should contain at least 20 observations.

- Price of your commodity (P)
- Quantity (production) of your commodity (Q)
- Per capita consumption of your commodity (PCQ)
- Prices of one substitute commodities (P)
- Quantities (per capita consumption) of the substitute commodity (PCQ)
- Disposable income (Y)
- Population (N)
- Consumer price index (CPI for food)
- Other variables appropriate to your commodity (such as price and production data on complementary goods)

When collecting the required data for your commodity, be sure to take notes (or photocopy or print the data) such that you know what the data represents. Is production reported in tons, metric tons, boxes (how much does each box weigh), or liters? Is the price or value of the product reported in \$ per pound, cents per ounce, or \$1000 per ton? Is the commodity value for shelled or unshelled, carcass or retail cut, etc.

Research Paper's Format

Your term paper is expected to conform to the following:

- Title page;
- Minimum of 5 and maximum of 10 pages *of text*, typed and double-spaced (10 points deducted per page under);
- Graphs, figures, tables and statistical results are NOT counted as text;
- When written text refers to reported statistical results, those results should appear on the following page (likewise for graphs and figures);
- An appendix which includes legible tables of raw and converted data in landscape format;
- Page numbers, where page 1 is the first page of text ;
- Identify sources throughout your paper or deductions will be made ;
- The paper is expected to follow the outline given on the following pages using a Table of Contents.

Outline for Commodity Price Analysis

I. Commodity Background and Current Trends. (20 points)

Briefly describe the market characteristics of your commodity. *Some* of the following topics will be *relevant* to your commodity. Discuss or use examples about those things below which impact your commodity's industry, in particular focus on the marketing aspects:

- Factors influencing demand
- Factors influencing price of the commodity
- Historical changes over the last 20, 50 or 100 years
- consumer health concerns
- complements and substitutes
- changes in per capita consumption over last 20 years, explain why there were changes
- changes in per capita consumption of substitute and complementary goods, explain why there were changes
- marketing channels
- international trade-which nations are the primary: producers, consumers, importers, and exporters
- principal companies/cooperatives handling/marketing the raw product
- origin/history of the commodity
- information on the factors influencing supply
- changes in technology that have effected the product
- important inputs in the production of the product

II. Statistical Interpretation.

You are to statistically estimate the coefficients of a demand relationship for your commodity using two types of equations (explanation to follow). **You are required to report the following information for all estimated equations:**

- Report the years of data used in estimation; state if you dropped any years and why;
- Justify the coefficient signs, explain why they are correct
- Include a discussion of statistical measures: t-values, coefficients of determination (R^2) and F values.
- Explain why you have the resulting variables in your equation
- Include the equation written out appropriately on the regression printout

Equation A: Quantity Dependent Demand (25 points) - (used for estimating elasticities).

You will estimate the parameters of a quantity dependent demand function for your commodity. The specification of the equation will be given in lecture. This must be done in order to accomplish the following:

Use your quantity dependent equation to create a table which reports the following—be sure to show your work (show how you computed the elasticities):

1. Compute the price elasticity of demand at the mean
2. Compute the price elasticity of demand at the most current year
3. Compute income and any cross elasticities at their means
4. Compute income and any cross elasticities at their most current years
5. Show how the elasticities were calculated and explain how this information can be used by the industry.
6. Discuss the difference between the estimated elasticities at the mean versus the current year?
7. Do the elasticities make sense for your product? Explain.

Equation B: Price Dependent Demand (20 points) - (used for predicting future prices). Estimate the parameters of a price dependent demand function for your commodity. The specification of the equation will be given in lecture.

Create a table to show your price predictions. Be sure you show your work using your equation to predict the 2006/2007 price under the following scenarios:

1. average values of the explanatory variables
2. what percentage will your dependent variable change if you increase supply by 10%
3. what percentage will your dependent variable change if you decrease income by 3%
4. what percentage will your dependent variable change if you increase supply by 5% and increase income by 5%
5. use the most current year's data to predict price
6. use the price you get from #5, find the new price when supply increases by 10%
7. use the price you get from #5, find the new price when income decreases by 3%
8. use the price you get from #5, find the new price when you increase supply by 5% and increase income by 5%

III. Construct and Modify Your Regression Model (25 points)

In this section, you need to use all the knowledge and skills you learn from this class to build a regression model under either the cross-sectional or panel data formats:

$$Y = b_0 + \sum b_i * X_i .$$

You need to provide at least 5 research papers to support your model assumption. You have to at least include 6 independent variables in your original model. Run the OLS regression and report your result, including Hypothesis Test, Interval Estimation, and ANOVA. You also need to test for Heteroskedasticity and Autocorrelation.

Modify your model according to the work you've done so far, report the best model you can find and predict the commodity price, using the predicted value of your variables (which you need to explain to me the values you use).

IV. Time Series Analysis and Forecasting (optional, for bonus points):

Use the Moving Average, Exponential Smoothing, and Panel data approaches to construct your time series forecasting models. You need to include MAD and to compare your forecasting values with the real past data to show me which model would give you the best prediction of the future price.

Please write out and interpret the meaning of the difference of these models.

VI. Conclusion (10 points).

Given all the information you have gathered and the analysis you have conducted, briefly discuss your overall view of the current market for your product. What does the future look like for your commodity? What trends will have the greatest impact on demand for your commodity. What did you learn from this project?

VII. Bibliography (required, you will get zero point for the entire paper if you do not provide this part of information)

- all web pages cited must include web page title and full web page address
- at least two scholarly publication must be used (textbook, journal article, research paper,...)
- an interview with at least one person (not related to you) who has some expertise in the industry
- Sources must be identified throughout your paper.