

ACE 427
Spring 2009

Lecture 3

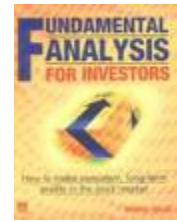
*Fundamental Analysis of Crop Prices: The Balance
Sheet Approach*

by
Professor Scott H. Irwin

Required Reading:

**Vogel, F.A. and G.A. Bange. “Understanding USDA Crop Forecasts.”
Miscellaneous Publication No. 1554, US Department of Agriculture, National
Agricultural Statistics Service and Office of the Chief Economist, World
Agricultural Outlook Board, 1999. (427 compass website)**

**Childs, N., and J. Kiawu. “Whats Behind the Global Surge in Rice Prices.”
Amber Waves, September 2008, p. 3. (427 compass website)**



Fundamental Analysis

- Definition: An assessment of _____ based on the underlying _____ and _____ factors and the changes in those relationships
- Motivated by economic _____ of supply and demand
- The task of the market is to establish a price that will _____
- Fundamental analysis can be thought of as the process of anticipating the market clearing price
- Techniques: Subjective judgment to sophisticated statistical models
- Goal: Estimate _____ and compare to _____

▪ Bullish: $\text{Value} > \text{Price}$



▪ Bearish: $\text{Value} < \text{Price}$





THE INVISIBLE HAND OF THE MARKETPLACE

Price Making Forces in Crop Markets

- A _____ set of variables impact _____:

- Acreage
- Yield
- Weather
- Exchange rates
- Consumer income
- Government policies
- Foreign grain production



- Additional factors that add to _____:
 - Lack of adequate knowledge of _____ relationships
 - Large amount of inventory _____
 - Constant _____

Types of Fundamental Analysis

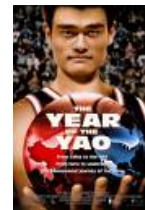
Old Hand Approach



Subjective approach based on extensive _____ of an analyst:

- _____ for the market based on extensive industry contacts
- Well-tuned to flow of _____ and market's reaction to the news
- _____ of the market contained “in the head” of the analyst
- Strictly individual approach that can only be acquired by long experience

Analogous Year Approach



_____ for marketing years for crops or calendar years for livestock that have the _____ fundamental characteristics as projected for the forecast year

- _____ for the analogous year serves as the “road map” for the projecting prices in the forecast year

- Basic premise is that “history repeats itself”

Frick (Ch. 24, Schwager on Fundamental Analysis) states that analogous year approach requires four steps:

1. Ascertain the pertinent _____ expected to be in effect for a certain time period, usually a crop year.
2. Note the major _____ (levels and date) for past seasons that shared those fundamental factors.
3. Look at _____ in those analogous seasons to see if the timing or magnitude of the price movements were similar in most or all of the years. (If no consistent similarities are evident, use another approach.
4. Use the magnitude of price movements and timing of major price reversals in the fundamentally similar years to _____ the current season price pattern into the forecast period.



Econometric Models

_____ are used to forecast prices

Economic theory used to guide the specification of relationships

$$PH_t = a + b_1PP_t + b_2BP_t + b_3CP_t + b_4DI_t$$

where

PH_t is the price of hogs for quarter t

PP_t is per person production of pork in quarter t

BP_t is per person production of beef in quarter t

CP_t is per person production of chicken in quarter t

DI_t is per person US disposable consumer income in quarter t

OLS is used to _____ intercept and slope parameters based on a given sample period

Econometric models range from simple _____ equation models to large, _____ models

- Large econometric models were very popular in the 1960s and 1970s
- Fell out of favor in the 1980s when _____ models were shown to forecast just as well
- Not surprising given principal of parsimony!

J. PHILLIP COOPER and
CHARLES R. NELSON*

The Ex Ante Prediction Performance Of the St. Louis and FRB-MIT-PENN Econometric Models and Some Results on Composite Predictors

1. INTRODUCTION

The primary objective of this paper is to evaluate and compare the prediction performance of two econometric models of the U. S. economy, namely, the St. Louis¹ (SL) and FRB-MIT-Penn² (FMP) models, using Box-Jenkins [5] time series models to provide a benchmark for accuracy. The two econometric models have received considerable attention in both academic and policy-making contexts. The fact that they differ greatly in a number of important dimensions is an additional motivation for the choice of these particular models.

Computation of predictions from the econometric models requires their solution³ for a given time period conditional on projected values of the exogenous variables. If the time period in question is in the real past, then the simplest method of projection sets the exogenous variables at their actual values. We refer to the resulting predictions as ex post predictions. In an earlier paper, Nelson [16] evaluated the ex

*The authors are indebted to Carl Christ, Edwin Kuh, Franco Modigliani, Harry Roberts, Arnold Zellner, and a referee for their helpful comments. Computation was financed by a grant from the Research Committee of the Graduate School of Business and was performed on Program PDC and the Econometric Software Package (ESP). Cooper's participation was partially supported by the National Science Foundation under NSF Grant GS 29711 and Nelson's under NSF Grant GS 34501. A preliminary version of this paper was given at the Meetings of the Econometric Society, New Orleans, 1971.

¹The St. Louis model is described by Andersen and Carlson [1].

²The FMP model has been described by Rasche and Shapiro [18], de Leeuw and Gramlich [8, 9], Ando and Modigliani [3], Modigliani, Rasche, and Cooper [15], and Zellner [21]. We used version 4.1, released during the summer of 1969 in this study.

³For a discussion of the solution method of the FMP model, see Cooper [6] or Fromm and Klein [10]. The SL model has a "triangular" structure and does not require an iterative solution method.

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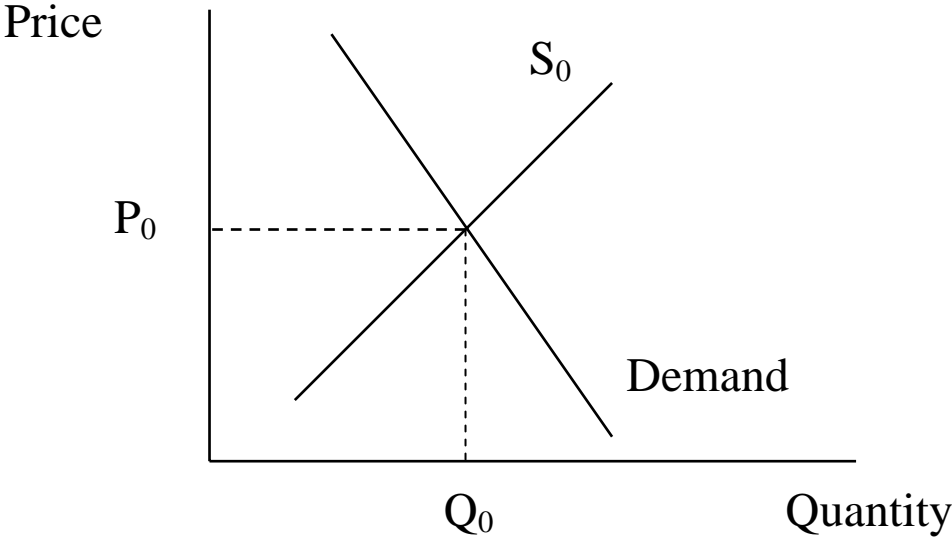
Balance Sheets

- Most popular tool used in fundamental analysis of crop prices
- Unit of analysis is a _____
- Constructed for a particular _____, _____ or the entire _____
- Build _____ side first
- Then build _____, or use, side
- _____ ties both sides together by rationing available supplies to competing uses

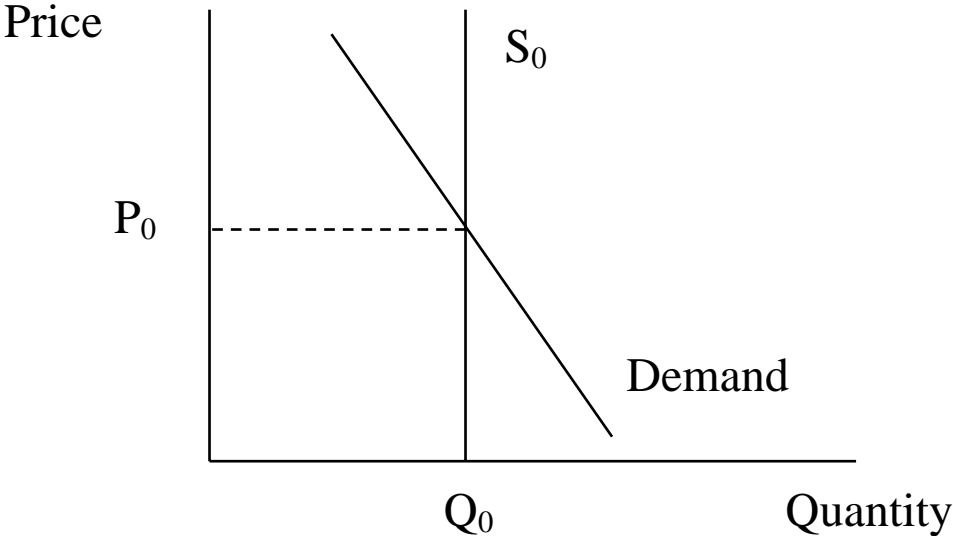
Marketing Year

- Usually begins the _____ for a crop
- For the US:
 - Corn: September 1 – August 31
 - Soybeans: September 1 – August 31
 - Wheat: June 1 – May 31

Economic Model Underlying Balance Sheets before Planting



Economic Model Underlying Balance Sheets after Planting



Generic Balance Sheet Format for a Commodity

Beginning Stocks
+ Production
+ Imports
= Total Supply
Domestic Consumption
+ Exports
+ Residual
= Total Consumption (Use)
Ending Stocks = Total Supply – Total Consumption

Balance Sheet Format for Corn

Beginning Stocks
+ Production
+ Imports
= Total Supply
Feed and Residual
+ Food, Seed and Industrial Ethanol
+ Exports
= Total Consumption (Use)
Ending Stocks = Total Supply – Total Consumption

Balance Sheet Format for Soybeans

Beginning Stocks
+ Production
+ Imports
= Total Supply
Crush
+ Exports
+ Food, Seed and Residual
= Total Consumption (Use)
Ending Stocks = Total Supply – Total Consumption

Forecasting Calendar for 2009/10 Corn and Soybean Balance Sheets

- Fall 2008: First forecasts of supply and use for 2009/10 marketing year
 - Typically based on _____, recent _____ and basic _____
- Spring 2009: Update _____ forecasts based on _____
- Summer 2009: Update supply forecasts based on _____
- Fall 2009-Summer 2010:
 - Continue to update supply forecasts based on USDA crop reports (Aug-Nov, Jan)
 - Update _____ forecasts based on:
 - Export sales and inspections reports
 - Quarterly USDA stock estimates
 - Livestock numbers
 - Monthly processing reports

WASDE Balance Sheet Estimates from the USDA

- WASDE: _____

- Released monthly 12 times a year
- Cover numerous crops and livestock
- Separate balance sheets maintained for over 90 countries!
- _____ and _____ published for major commodities
- Serve as the _____ balance sheet estimates for nearly all market participants
- Numerous agencies within USDA participate in _____



United States
Department of
Agriculture

Office of the
Chief Economist

World Agricultural Supply And Demand Estimates

Agricultural Marketing Service
Economic Research Service
Farm Service Agency
Foreign Agricultural Service

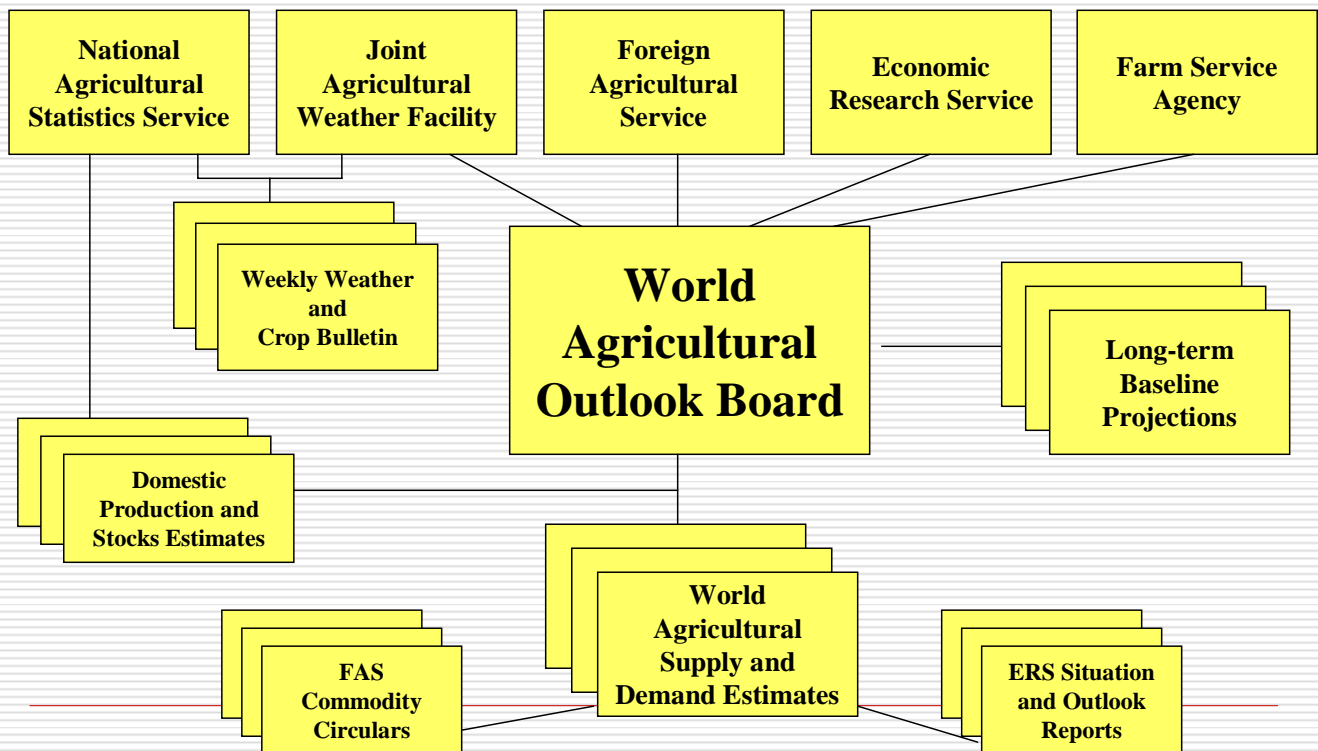
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USDA's Economic Information System



- ***Foreign Agriculture Service (FAS)***: information regarding foreign production, use and trade
<http://www.fas.usda.gov/>

- ***Economic Research Service (ERS)***: identifies important economic effects and implications for prices, quantity supplied and quantity demanded
<http://www.ers.usda.gov/>

- ***Farm Service Agency (FSA)***: describes current policy environment and farmers' reaction to current policies
<http://www.fsa.usda.gov/pas/default.asp>

- ***Agricultural Marketing Service (AMS)***: provides current price and marketing reports
<http://www.ams.usda.gov/>

- ***World Agricultural Outlook Board (WAOB)***: co-ordinates the interagency process used to produce WASDE estimates
<http://www.usda.gov/agency/oce/waob/waob.htm>

WASDE reports can be found on the web at:

<http://www.usda.gov/oce/commodity/wasde/index.htm>

WASDE-454-12

U.S. Feed Grain and Corn Supply and Use 1/

Item	2005/06	2006/07 Est.	2007/08 Projections	
			December	January
FEED GRAINS				
Area		Million acres		
Planted	96.4	92.5	109.1	109.1
Harvested	85.9	80.1	97.8	98.4
Yield per harvested acre	3.47	3.50	3.62	3.57
		Million metric tons		
Beginning stocks	58.8	54.7	36.2	36.2
Production	298.6	279.9	353.5	350.9
Imports	1.9	2.4	2.7	2.7
Supply, total	359.3	337.1	392.4	389.7
Feed and residual	163.2	148.3	151.4	159.0
Food, seed & industrial	81.5	94.2	121.8	120.8
Domestic, total	244.7	242.5	273.2	279.8
Exports	59.8	58.4	70.3	70.6
Use, total	304.5	300.9	343.5	350.4
Ending stocks, total	54.7	36.2	48.8	39.3
CCC inventory	0.0	0.0	0.0	0.0
Free stocks	54.7	36.2	48.8	39.3
Outstanding loans	4.4	3.0	5.9	5.9
CORN				
Area		Million acres		
Planted	81.8	78.3	93.6	93.6
Harvested	75.1	70.6	86.1	86.5
Yield per harvested acre	148.0	149.1	153.0	151.1
		Million bushels		
Beginning stocks	2,114	1,967	1,304	1,304
Production	11,114	10,535	13,168	13,074
Imports	9	12	15	15
Supply, total	13,237	12,514	14,487	14,393
Feed and residual	6,155	5,598	5,650	5,950
Food, seed & industrial	2,981	3,488	4,590	4,555
Ethanol for fuel 2/	1,603	2,117	3,200	3,200
Domestic, total	9,136	9,086	10,240	10,505
Exports	2,134	2,125	2,450	2,450
Use, total	11,270	11,210	12,690	12,955
Ending stocks, total	1,967	1,304	1,797	1,438
CCC inventory	0	0	0	0
Free stocks	1,967	1,304	1,797	1,438
Outstanding loans	171	116	230	230
Avg. farm price (\$/bu) 3/	2.00	3.04	3.35- 3.95	3.70- 4.30

Note: Totals may not add due to rounding. 1/ Marketing year beginning September 1 for corn and sorghum; June 1 for barley and oats. 2/ For a further breakout of FSI corn uses including ethanol, see the Feed Outlook table 5 or access the data on the Web through the Feed Grain Data Delivery System (<http://www.ers.usda.gov/db/feedgrains/>). 3/ Marketing-year weighted average price received by farmers.

Constructing Early Season 2009/10 Balance Sheets for Corn and Soybeans

- The first WASDE estimates will not be released until _____
- We will use Dr. Good's projections as our starting point
- We will _____ the projections throughout the semester as more _____ becomes available

Note:

In practice most market analysts use some _____ of the old hand approach, analogous years, econometric models (usually single equation) and balance sheets

_____ and _____ of the different methods is highly _____ and varies from analyst-to-analyst

Why use multiple approaches?

- Reality is so _____ that no single approach is likely to forecast accurately at all times
- In the best case, different approaches add _____ not picked up by the other approaches