Fundamental Analysis - Chapter 10

Price Analysis: A Fundamental Approach to the Study of Commodity Prices

Balance Sheet Analysis

Highlights

- Balance sheet analysis is the most important tool for fundamentals-based price forecasting.
- This chapter covers the balance sheets take, and introduces the USDA WASDE balance sheet.
- This chapter shows the affects each row of the balance sheet.
- This chapter provides a timeline of when the rows of a balance sheet can be updated.

Balance Sheet Analysis (CONT...)

Check Your Understanding

- Do you know which cells in the balance sheet must be estimated by the USDA and which can be calculated from other cells in the table?
    - Fundamental analysis is an assessment of price based on underlying supply and demand factors.
    - Focusing on changes in the relationship between supply and demand allows one to calibrate an informed opinion of the value of the commodity.
    - The main role of the market is to find the value supply equals to demand.
    - The estimated 'fundamental value' is simply a forecast, or expectation of, the market clearing price.
    - The goal of any forecasting exercise is to compare the forecast to the current market price and make decisions accordingly.

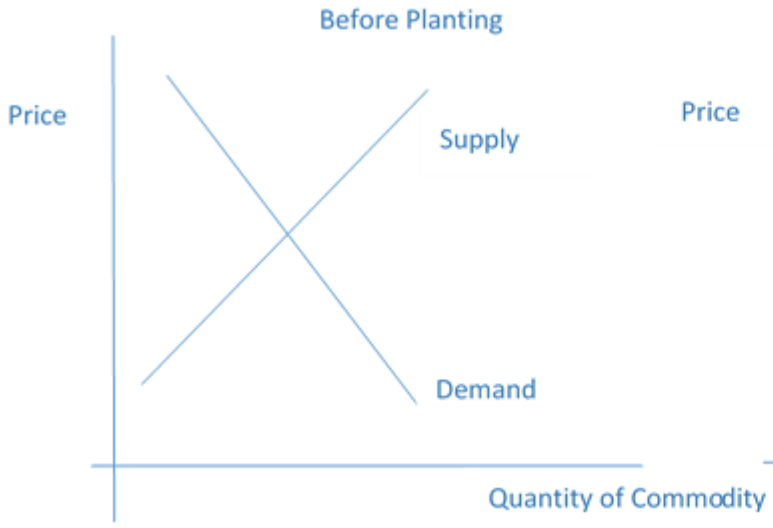
Balance Sheet Analysis (CONT...)

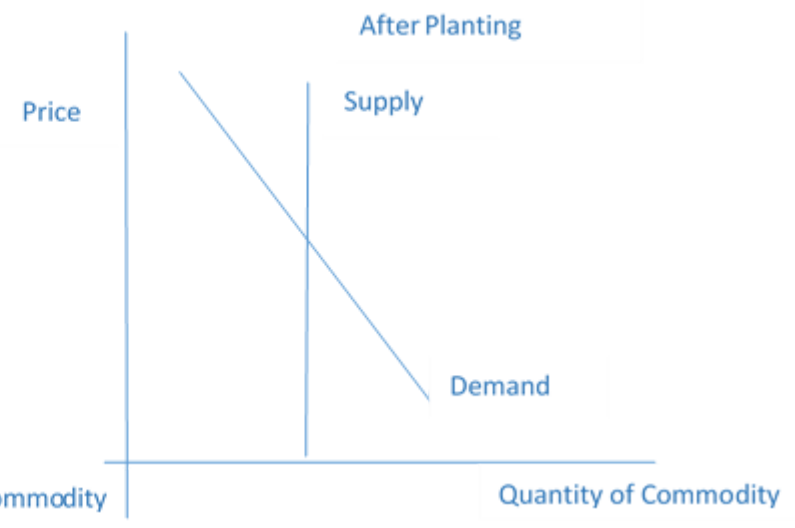
Check Your Understanding

- If your forecast is above the current market price, that is bullish because your forecast implies the market is undervaluing the commodity.
- An opportunity to buy low and sell high!
- If your forecast is below the current market price, that is bearish because your forecast implies the market is overvaluing the commodity.
- An opportunity to sell high and buy low!

Supply and Demand

- Conducting fundamental analyses involves taking into account.
- All the factors that determine supply, demand, and ultimately, prices.
- For grain markets there are basically two supply models to keep in mind:
    - Preplanting
    - Post planting.
- The intuition here is simply that before planting, the final supply for the crop can be affected by farmers.


Before Planting
Price
Supply
Demand
Quantity of Commodity


After Planting
Price
Supply
Demand
Quantity of Commodity

Supply and Demand (CONT...)

Supply is Affected by:

- Acreage
  - Prices of crops competing for acreage
  - Pre-Plant Weather
- Yield
  - Post-Plant Weather
- Government Policies

Supply and Demand (CONT...)

Supply is Affected by:

Acreage

- Before planting, farmers plan how much acreage to devote to each commodity, thus determining the baseline expected production level.
- Before summer weather is revealed, expected production is simply `Acreage X Trend Yield`.
- In the Corn Belt, farmer's decision matter where planting the acres between corn and soybeans, their relative prices.
- If futures prices indicate planting soybeans will be more profitable than planting corn, farmers will plan to devote more acres to soybeans.

Supply and Demand (CONT...)

Supply is Affected by:

Acreage

- For Example:
  - Weather can be an important determinant of acreage decisions as well.
  - The most ardent planting intentions of a farmer can be derailed by persistent wet weather.
  - An unusually rainy planting season can reduce planted acres from intentions.
  - Before the crop is actually in the ground, the supply of grain is relatively elastic.

Supply and Demand (CONT...)

Supply is Affected by:

Yield

- After the crop is planted supply is quite inelastic.
- There is still considerable uncertainty related to the of the crop will yield.
- This is largely determined by weather during the growing season.

Supply and Demand (CONT...)

Supply is Affected by:

Government Policies

- The government has been heavily involved in Agriculture in the United States since the great depression of the 1930's.
- There have been programs that guarantee a minimum price, minimum revenue and various incarnations of crop insurance programs.
- Occasionally these favor the production of one type of crop over another.
- When this happens, farmers predictably respond by planting more of the crop treated more favorably by the program.

Supply and Demand (CONT...)

Demand is Affected by:

Consumer Income

- When people have more money, they will spend it on goods.
- This means increased demand for commodities and their derived products.
- This includes foreign income, since exports are a big component of demand for commodities in the United States.
- Rising incomes usually means rising consumption of meat, which increases the demand for commodities like corn, soybeans, wheat etc.

Supply and Demand (CONT...)

Demand is Affected by:

Exchange Rates

- Exchange rates also affect demand through their influence on exports.
- For Example:
    - If the U.S. dollar is weak, then consumers in other countries can buy dollars cheaply - giving them more purchasing power for goods denominated in dollars.

Balance Sheet

- Most fundamental analyses rely on maintaining balance sheets of a commodity for a country, region, or the world.
- The approach is to maintain a careful accounting of supply exists and quantity of the commodity has been used.
- Through various means we will explore, one arrives at a price that is expected to ration remaining supplies across competing uses.

Balance Sheet (CONT...)

The Marketing Year and Balance Sheet Forecasting Schedule

- Balance sheet analysis is often organized by marketing year.
- Since production happens once per year, the marketing year is defined in the first month the commodity is harvested aT ends with the following year's harvest:

Crop	Beginning of Marketing Year - First Month of Harvest
Corn	September
Soybeans	September
Spring Wheat (Chicago)	August
Winter Wheat (KC)	July

Table 1. Beginning of Marketing Year by Crop.

Balance Sheet (CONT…)

The Marketing Year and Balance Sheet Forecasting Schedule

- Forecasting supply and demand for any given marketing year begins well before harvest. Table 2: Forecasting Calendar for 2017/2018 Marketing Year with Harvest in September 2016:

Timeline	Forecasting Focus
Fall 2016	The first forecasts of supply based on , *trend forecasts*, *recent history*, *economic relationships*
Spring 2017	Update supply forecasts based on USDA acreage surveys.
Summer 2017	Update supply forecasts based on weather and USDA crop and stocks reports
Fall 2017	Update supply forecasts as yield uncertainty is resolved through harvest reports and USDA production reports
Summer 2018	Update supply forecasts based on USDA production revisions, southern hemisphere production, stocks, and use reports.

Southern Hemisphere Production

- Production of corn, soybeans, and other commodities in the southern hemisphere has grown rapidly over the last ten to fifteen years.
- It has impacted global commodity markets tremendously.
- Since southern hemisphere production occurs in the middle of marketing years organized by northern hemisphere harvest.
- There is an uncertain additional supply that must be forecast and updated to keep an accurate global balance sheet.

Uncertainty

- Even careful accounting of supply and demand factors make up the balance sheet leaves a tremendous amount of uncertainty in the market.
- Demand can be difficult to forecast, and can sometimes change dramatically.
- The USDA keeps careful track of stocks, but we only get stocks estimates once a quarter.
- Between *Grain Stocks* reports there is always a great deal of speculation.
- The pace of consumption we are eating into stocks at a faster or slower pace than expected.
- Analysts talk about whether the market is on pace to achieve the forecast level of ethanol crush, soybean crush, or exports.

Balance Sheet Format

The common format balance sheets for any commodity have in common.
Table 3. Balance Sheet for a General Commodity:

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

```
## Response [https://www.usda.gov/oce/commodity/wasde/wasde0221.xls]
##   Date: 2021-02-18 19:58
##   Status: 200
##   Content-Type: application/vnd.ms-excel
##   Size: 326 kB
## <ON DISK>  C:\Users\mindy\AppData\Local\Temp\RtmpqwrGdA\file69834620e3.xls
```

CORN	2018/19	2019/20 Est.	2020/21 Proj. Prev	2020/21 Proj.
Million Acres				
Area Planted	88.90	89.70	90.8	90.8
Area Harvested	81.30	81.30	82.5	82.5
Bushels				
Yield per Harvested Acre	176.40	167.50	172.0	172.0
Million Bushels				
Beginning Stocks	2140.00	2221.00	1919.0	1919.0
Production	14340.00	13620.00	14182.0	14182.0
Imports	28.00	42.00	25.0	25.0
Supply, Total	**16509.00**	**15883.00**	**16127.0**	**16127.0**

Balance Sheet Format (CONT...)

- USDA makes regular reports on the balance sheet for commodities.
- Most of them conducing private analyses with balance sheets use the USDA categories.
- USDA estimates can be taken as a benchmark.
- The supply side (Stocks) is relatively straightforward.
- Total stocks for the marketing year will be beginning stocks, the portion of last year's stocks that were not used up during the previous marketing year.
- Plus this year's production, any imports of the commodity.
- Summing these three reveals the total amount of the commodity available for use during the marketing year.

Balance Sheet Format (CONT...)

Beginning Stocks:

- Some production from the previous year usually remains into the next crop season.
- Carryover stocks function as a buffer against current year yield uncertainty.
- For example:
  - If carryover stocks are high and current year yield is expected to be below trend, the market price may fall in response but modestly.
  - If carryover stocks are low - resulting from several years of below trend production and strong demand.
  - An expected yield below trend will likely cause a volatile rise in prices.

Balance Sheet Format (CONT...)

- The balance sheet for corn follows the same generic patter.
- We can be a bit more specific with the use of the categories.
- Since we know the major use of the categories are for any given commodity.

Balance Sheet Format (CONT...)

The use components are as follows:

- Feed and Residual:
  - A large portion of the corn crop is used as feed for livestock (cattle, pigs, poultry).
- Food, Seed, and Industrial:
  - Corn is used to make tortilla chips, high fructose corn syrup, edible oil and other food items.
  - A portion of the crop is grown specifically as seed for the next years crop.
  - There are some industrial uses for components of processed corn. Those are grouped in this category as well.
- Ethanol production also demands a significant amount of corn, so much that it gets its own line in the balance sheet.
- It is technically part of the Food, Seed, and Industrial category.

Balance Sheet Format (CONT...)

The use components are as follows:

- For soybeans, stocks are comprised of beginning stocks, production, and imports.
- The general balance sheet and the corn balance sheet.
- The use side, contains items specific to soybeans:
- Crush:
    - The amount of raw soybeans that are processed into soybean oil and soybean meal.
    - Soybean oil is used predominately as edible oil; it also is used to make bio-diesel in modest quantities.

Balance Sheet Format (CONT...)

The use components are as follows:

- Food, Seed, and Industrial:
  - We saw this category in the corn balance sheet.
  - The definition remains the same.
- Exports:
  - The United States exports a large quantity of soybeans to global buyers.
- The final use category is export.
- Corn grown in the United States is consumed around the globe, and strength or weakness in the export market is a carefully component of demand.

Coming up with a Price

- Balance sheet forecasting is definitely as much art as it is science.
- It involves tracking of the rate and use of commodities.
- One should intuitively see the forecasted ending stocks is a measure of scarcity of the commodity.
- It should be negatively related to price (i.e., tight ending stocks go along with high prices).
- One needs to pin down the exact nature of this relationship in order to form a meaningful forecast of price from a commodity balance sheet.

Exercises

1. Copy and paste the corn and soybeans balance sheets into a spreadsheet.
    - In the cell next to = Total Supply, manually add the cells needed to reproduce the '=Total Supply' number.
    - in the cell next to = Total Consumption, manually add the cells needed to reproduce the = Total Consumption number.
2. If you were making a forecast in July 2015 for the 2014/2015 marketing year balance sheet, which columns (if any) should remain fixed? I.e., they are already determined and do not need to be forecast.
3. If you were making a forecast in July 2015 for the 2015/2016 marketing year balance sheet, which columns (if any) should remain fixed?

Chapter End