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Stocks Programs Under Market Orientation

U.S. Government grain stock programs are an outgrowth of the nonrecourse loan program which has been used to support prices of commodities above the long run free market level. The stock holding programs, which use price as the trigger to signal the accumulation of stocks, distort both domestic and export market prices. Recent discussions concerning trade liberalization and efforts to move toward a market-oriented system for grains and other field crops have raised questions about the purpose and effectiveness of storage programs in general and nonrecourse loans in particular. Stocks programs including the CCC nonrecourse loan, the Farmer Owned Reserve (FOR), and the Emergency Wheat Reserve and direct purchases of certain commodities are being re-evaluated.

Although originally intended as a safety net program, in the 1930's, to keep prices from declining too far below the long run expected prices the nonrecourse loan was quickly converted into an income enhancement program. CCC and FOR loans have been operated as essential elements of the basic farm price support system. Until recently, their effect has been to keep prices received for grains at or above the loan rate which was above long run market clearing prices. For the most part, the price support loans raised the incomes of producers, because demand for the supported commodities is inelastic.

REASONS FOR GOVERNMENT STORAGE

Although the private sector will try to equate marginal cost and marginal revenue from storage, the Government decision to store commodities is based on different objectives including; price enhancement, price stability, income enhancement, food security, and humanitarian aid--both emergency and long term. The existence of stocks has led to programs that attempted to use them. Storage programs have, to some extent, come to be seen as programs separate and independent from price and income support.

A safety net: The quantity shocks that occur because of weather induced yield variability, are not trivial conditions to be dismissed as part of the expected variability in agriculture. If no other changes occurred, weather, alone, would distort the market by bringing about a mismatch between expected and actual yield and therefore expected and actual prices, because the market allocates the actual output at whatever price consumer will pay. As a result of weather changes, it often takes several production periods to identify the existence of fundamental market changes, that is, shifts in demand or shifts in supply caused by economic forces.

The initial storage program was conceived as a device to assist farmers in marketing their grain. Rather than sell at harvest they could market their grain later in the year at higher prices. The loan rate was to provide a short term cushion for short run prices near the long term market price. Only in years of severely depressed prices would grain be forfeited to the CCC. It was believed that, more often than not, the market would clear at prices above the loan rate for nonrecourse loans.

Price stability: The safety net was a subset of the price stability objective of storage programs. Supporting prices in the short run to avoid seasonal price weakness resulted in carryover of stocks under CCC ownership into future production periods. Price changes were thus smaller and prices were less likely to drift far from the loan rate.

Income support: The Agricultural Act of 1938 modified the objective of the CCC storage program. The Act institutionalized parity as a concept in farm policy and provide for price enhancement as part of the program to raise farm income. Nonrecourse loans were to provide a floor for prices relative to a "parity" standard. Price enhancement, through market supply control, for the purpose of supporting income became the major reason for U.S. storage programs. The focus on price as the trigger variable to initiate a Government action prevented the price from serving as a true signal for production in future periods. And the market's allocation of the current year's crop was distorted because the distribution of expected price was truncated on the lower end and the expected price faced by the producer was necessarily higher than the price floor.

Food aid to developing countries: Food aid was introduced as a response to stock accumulation with the passage of PL 480 in 1954. In reality, PL 480 provide a device to manage stocks by subsidizing exports. Stocks were not acquired specifically for aid purposes, but stocks on hand could be sold on the export market at discount prices, bartered or donated. Over time food aid has come to be a justification for acquiring stocks rather than a mechanism for disposing of them.

Emergency reserves: The aid aspect of storage was enhanced with the institution of the Emergency Wheat Reserve in the 1977 Act. The emergency reserve, which consists of up to 4 million tons of wheat, is used to help other countries cope with food shortages, and thus focuses upon developing country food security.

Food security: For the most part, food security and food aid objectives have evolved from the presence of existing stocks rather than bringing about programs to acquire stocks for that purpose. The concept of domestic food security as an aspect of U.S. storage programs was implemented with the institution of the Farmer Owned Reserve in the 1977 Act. The Farmer Owned Reserve was intended to assure adequate supplies and stabilize commodity prices across marketing years by offering producers incentives to hold stocks under the restriction that grain could not be removed from the reserve for three years -- unless a release price was reached. Eligibility requirements for the program, reserve entry and release prices, storage payments, whether to waive interest charges, and the maximum size of the reserve, are all up to the Secretary's determination.

Export expansion: The subsidized sales from stocks under the Export Enhancement Program (EEP) have been implemented along with marketing loans to keep U.S. Commodities competitive in export markets and draw down stocks under loan and from CCC ownership.

MARKET FORCES AND STORAGE PROGRAMS

Agricultural production is subject to seasonality, weather related problems and environmental problems. These forces are somewhat unique to agriculture and create uncertainty in the relationship of input to output.

Seasonality: Seasonality results in an imbalance between output and consumption on an intra annual basis. Prices are depressed at harvest and higher in other periods of the year. Seasonality of production is the primary reason for commercial storage activity in grain markets, because production, in particular harvest, of grain tends to take place in a limited number of days or weeks. Thus, an entire years supply is available early in the marketing year. However, consumption tends to be stable and evenly distributed through time. For the most part, no more or less grain would be required on any given day, week or month (except for seasonality in livestock production). The commercial storage function serves to allocate production through out the marketing year in the form of stocks.

The Weather Factor: An important source of annual variability in agricultural output and, therefore, annual variability in prices is the generalized variability in weather. The U.S. has an open economy and world wide weather changes must be considered as impacting on the total supply of commodities to our markets and the total demand for commodities. Because the national or global impact of weather on the quantity of output for any production season is unknown when a crop is planted, producers must formulate their production decisions on some expected normal yield and expected price. Once the resources are committed to production the producer has little control over output, and yields may vary sharply from the expected level. The wide variations in yield result in large aggregate shifts in quantity produced and in price changes that are magnified by the inelastic aggregate demand. Thus, income from production can vary from large positive returns to losses as the result of weather induced variability in yields.

Economic Forces: The argument is often made that forces other than weather are important sources of variability in agricultural markets. It has been suggested that producers need some aid due to the impact of changes in macroeconomic conditions, monetary and fiscal policy and in international exchange rates. However, these are the economic signals that the market is to translate into demand changes that show the need for more or fewer resources in the sector. Current agricultural policies insulate producers from much of the impact of these forces as well as the noneconomic shock from weather. If the market is to allocate resources and output, the underlying economics of the market must be visible to both producers and consumers. By dealing with the yield shock apart from the economic forces sufficient stability in prices will be achieved to guide longer run resource and production decisions.

Few argue would that the objectives of price stability or food security are misguided, but many have taken exception to the levels of stocks that have accumulated to support the income enhancement objective. The U.S. and it's competitors in export markets do not have domestic food security problems that compare with those of some developing countries. The U.S.'s problem is largely how to market the production from it's agricultural capacity, which is

in excess of domestic requirements, and still maintain a relatively stable income level for producers. Using grain reserves to support farm income in the face of excess productive capacity opens the real possibility for excessive stock accumulation, especially when market forces and other program provisions tend to encourage increased production and progressively lower real prices. By artificially holding enough grain off the market to support prices above those which would prevail in a competitively determined market, we also encourage competition from foreign producers. Although income support may be a legitimate government objective, particularly for select groups of farmers, shorting the market to raise commodity prices and placing the stocks in grain reserves appear to be a perverse tool for achieving this objective. It is difficult to justify continually accumulating grain far in excess of that needed for international food aid, emergency disaster relief, and domestic food security.

COMMERCIAL STORAGE

Commercial entities are interested in maximizing profit and reducing risk. Grain users would like to have sufficient grain to cover all contracts at prices that will allow them to return a profit. There is little incentive to carry more than pipeline needs from one season to the next, particularly when a higher cost of acquiring grain can be passed on to the final consumer and a higher revenue obtained because of the inelastic demand. Commercial stock holding, therefore, will be sufficient in a free market to cover one year's expected consumption plus pipeline needs which may vary according to the use of the crop. In order to identify the relationship between commercial storage and use of grains examples of commercial holding in free markets must be identified prior to the implementation of government storage programs.

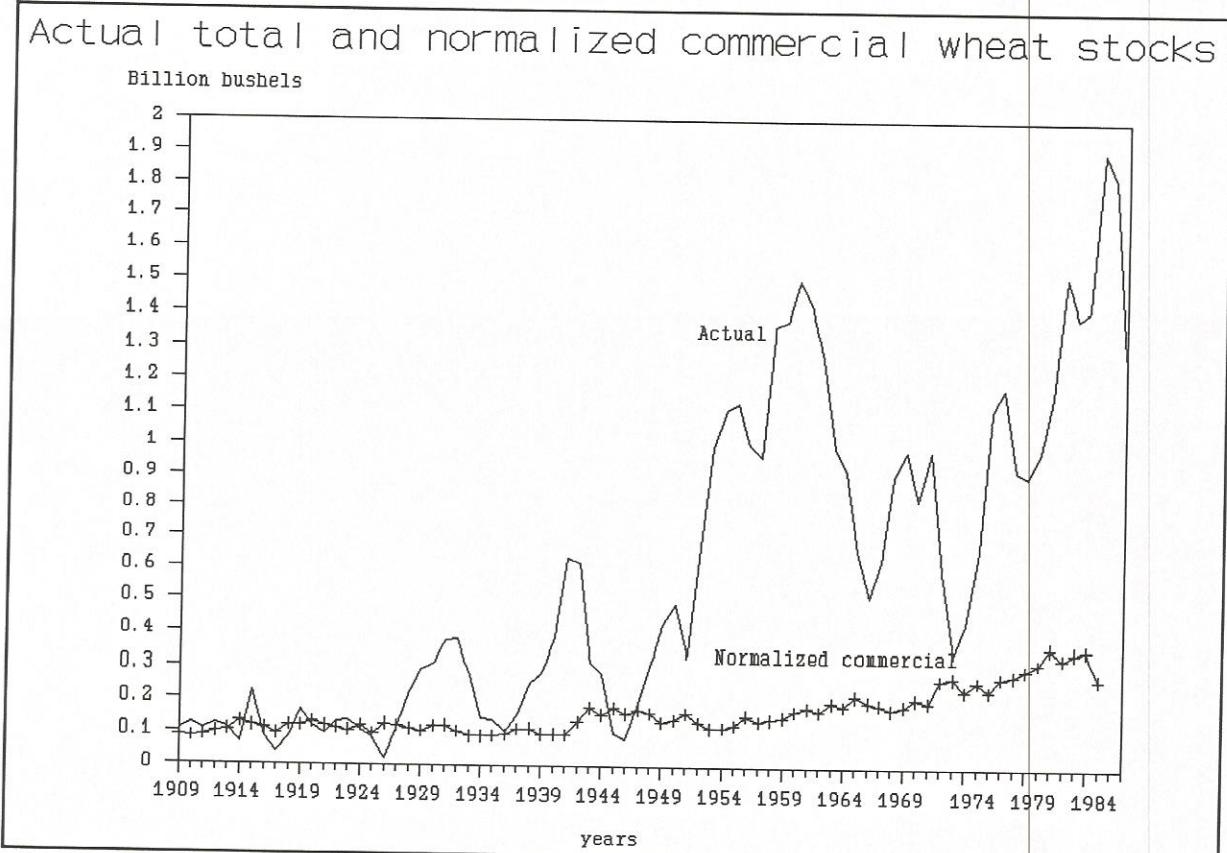


Figure 1

Figure 1 shows actual total wheat stocks from 1909 to 1987 and an estimate of normal commercial carry over. The normal commercial carry over is based on the average ratio of total stocks to total use during the period from 1909 to 1925. The difference between the normalized commercial stocks and total stocks represents the impact of Government programs on wheat stocks.

Since the beginning of Government programs, wheat stocks have approached pipeline levels twice, in 1945 and 1973. In both cases unique conditions existed which resulted in the depletion of large government stockpiles. In 1945, we were attempting to meet the food needs of Europe after World War II and in 1972 we emptied the bins through subsidized export sales to the USSR.

Figure 2 shows actual total and normalized commercial corn stocks. As with wheat a period before the implementation of programs was chosen to estimate normal commercial carryover. Because stocks data for corn begin in 1927 and no Corn stocks were held by the government prior to 1937 the 1927 to 1936 period was used to estimate commercial stocks to use ratios for corn. After the implementation of corn storage by the Government, stocks approach pipeline levels in 1945 and 1973 as with wheat and again in 1983 with the implementation of the PIK program.

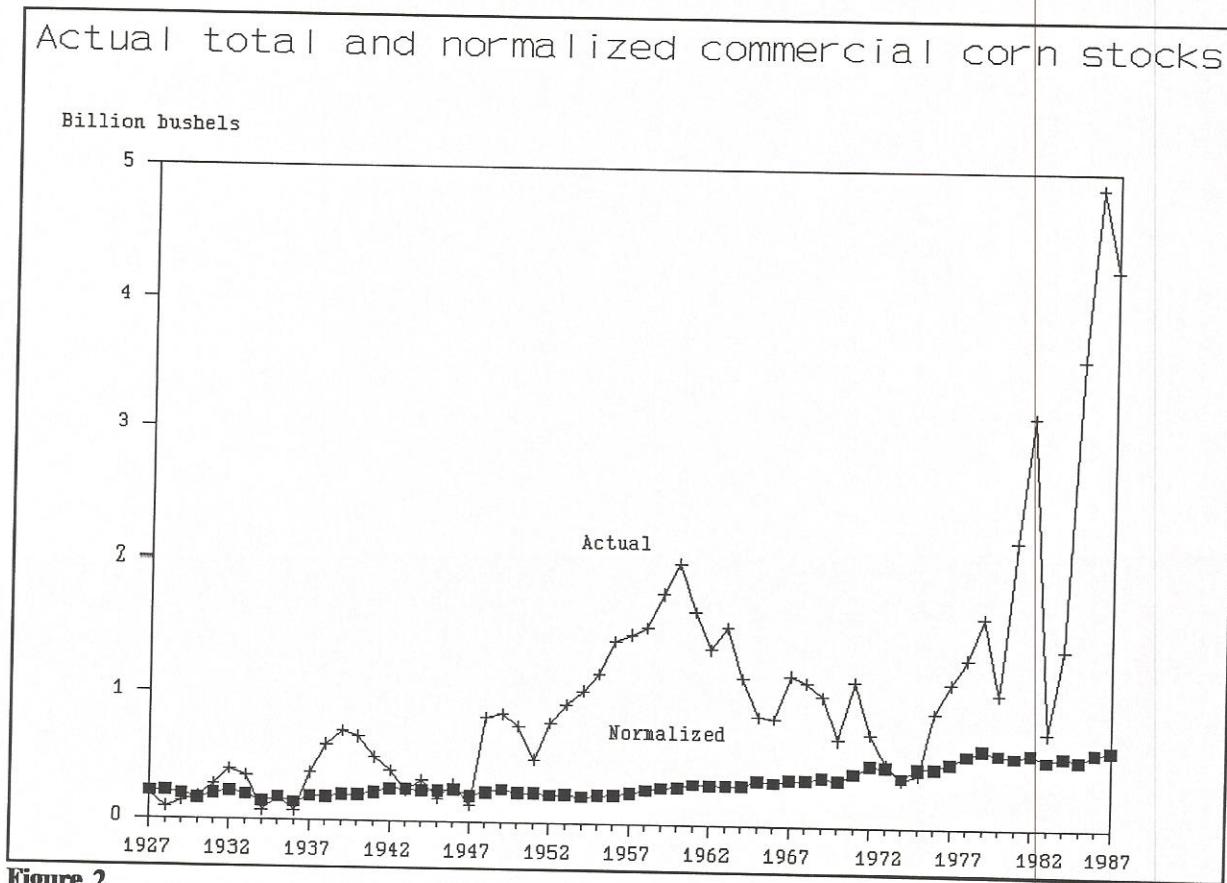


Figure 2

GOVERNMENT STOCKS IN FREE MARKETS

If stock acquisition is not used for price enhancement are there conditions in free agricultural markets that give rise to the need to store more than commercial firms are likely to hold? Would commercial storage provide the necessary storage capacity to meet perceived societal objectives or are the objectives of the commercial market and those of society sufficiently different that government action is beneficial? If a government stocks program is desireable, what characteristics should it have?

Options

Fixed Stock Levels: In the past some have recommended the establishment of a fixed level buffer stock that would be large enough to cover 80 or 90 percent of the expected shortfalls in production. However, a fixed target level of stocks is not desirable because it has the stock level as an objective rather than the stability of the quantity delivered to the market. Such a target level would tend to exacerbate price changes rather than buffer them.

Ever Normal Supply: An alternative proposal for stock acquisition and dispersal assumed that the annual variability in total production should move into and out of storage providing for an ever-normal granary. Assuming a relatively stable demand, stocks would increase and diminish with supply changes. However, adding to or releasing from stocks in response to changes in total quantity produced allows increases in output from acreage changes and from productivity changes to enter the stock pile and stocks accumulate so that they can not be removed from storage by normal production short falls. Such a program would capturing real or economic shifts in supply and demand thus distorting the market.

Yield Triggered Acquisition: If policy is changed from encouraging excess production with supported prices to free market pricing, then the appropriate response to changes in export demand would be to allow the market to clear the expected production. Although there is not an optimal stock level, there can be an optimum acquisition and dispersal program that is reactive to current year yield. Because yield for the coming season is a random variable, the stock change must offset it in the market ex post.

Timing of a government storage decision is critical to a yield rule program. Given the inability to forecast yield at planting time, government storage decisions must be made on the basis of yields estimated for the current crop. The decision on how much of the crop to store or offer to store must be made just prior to harvest when current year yields and acreage to be harvested are easily estimated.

A stocks program managed by a yield rule would stabilize prices with minimal interference with the allocation function of prices. Prices would be free to respond to changes in demand and supply, and the prices generated would not be clouded by the fog of price changes that resulted from yield changes.

An example program might offer to acquire the positive deviations from trend projected yield times the acres harvested at 85 to 90 percent of the most recent 5 year average price and offer these stocks for sale if the price rose above 115 percent of the 5 year average. This program would not accumulate large stocks but would reduce price variation due to yield changes. For the

program to be effective other storage programs, such as CCC nonrecourse loans and the Farmer Owned Reserve, would need to be discontinued to remove the entitlement aspect of the storage program.

The primary difficulty with a yield rule program is in the determination of the expected yield from which to calculate the deviation which the government would offer to purchase under high yield conditions. A purchase rule could be based on a liner trend of past yields or on deviations from a historical moving average yield. Because of changes in technology yields have trended upward. A ten year historical trend might provide an adequate measure on which to base expectation. An alternative would be to use a five year moving average corrected for trend changes in the average to avoid underestimation of the expected yield.

Figure 3 shows wheat surplus and deficits from yield base on a moving trend yield rule. The figure is based on actual yields and acres harvested since 1909, using a ten year moving trend yield projected one year as a basis for establishing expectations. During the period from 1933 to the present, acres harvested has varied with policy changes. Therefore, potential purchases in a free market would have varied from that shown. The data is illustrative of the variability and the possible quantities of wheat purchases and sales. Potential purchases varied considerably but stayed below 300 million bushels per year.

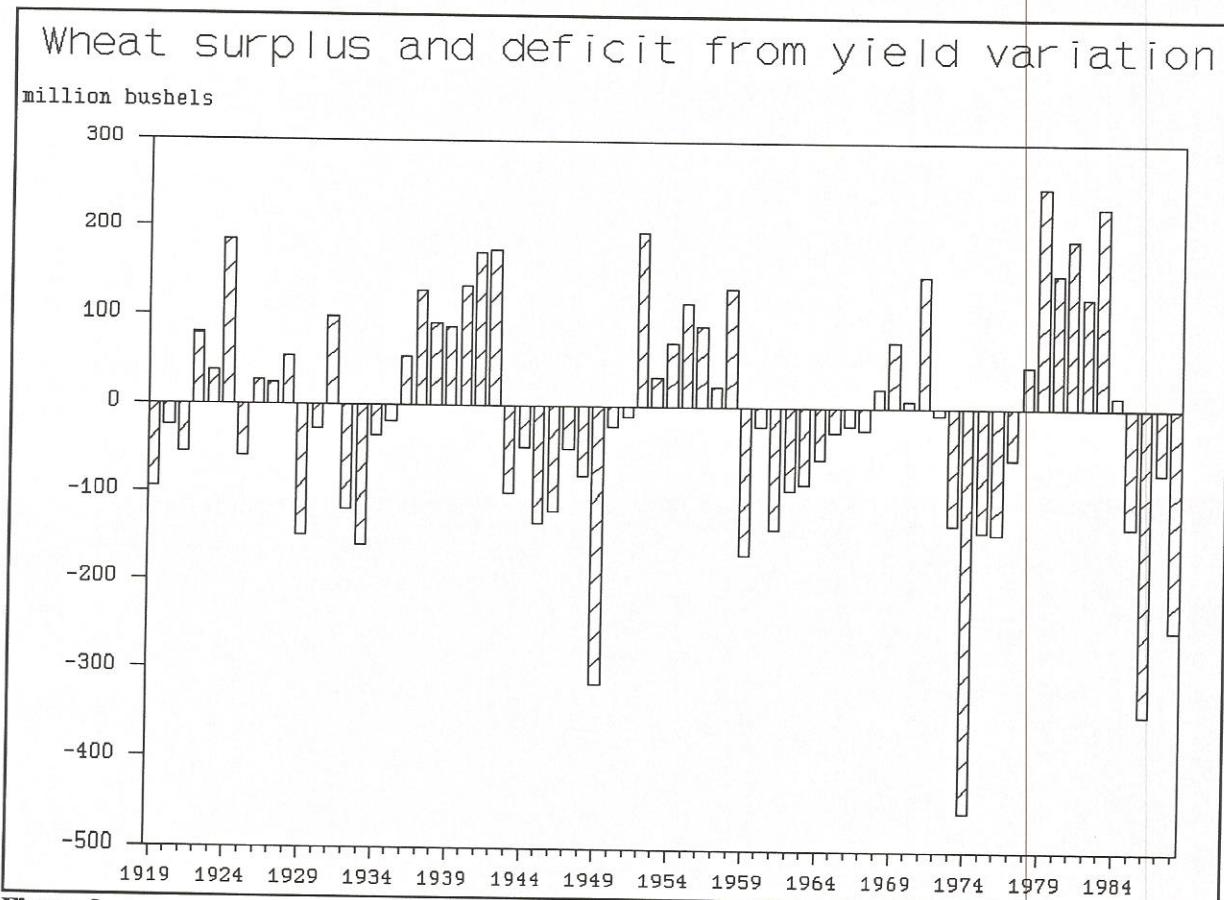
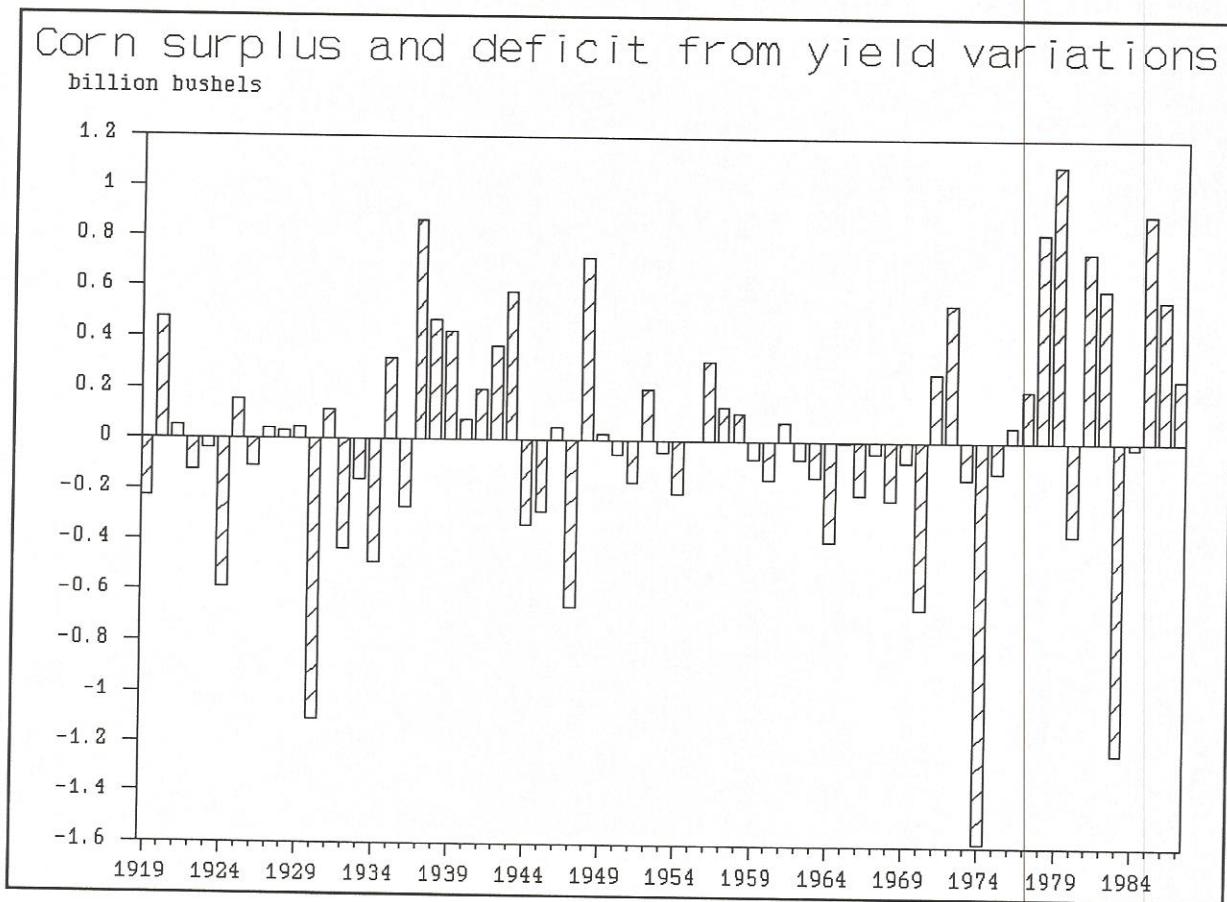


Figure 3

Figure 4 presents similar data for corn which shows considerably more variability in yields than does wheat. Also, the impact of drought and the PIK program alter the trend considerably since 1970. As with wheat acreage the

acreage producing corn is larger than would be expected in a free market, thus one would expect variability to be less and purchases less in a free market.



INTERNATIONAL STOCKS PROGRAMS

Implementation of the yield storage rule, world wide, would provide economic rationality on stock-holding policy. All producing countries would store the positive deviations from trend yield and dispose of them during periods of domestic negative yield deviations or high world prices.

Storing more than the positive deviations from trend would require that in some year the market would have less available than had been planned for by producers or expected by consumers. Storing less than the positive deviations means that the probability of incurring a shortfall in stocks is increased because the positive increment from yield has not been stored, but consumed, and future consumption must be reduced below what it could have been if stocks had been retained.

Each country could stand ready to buy or sell the additions to or shortfalls from trend yield on whatever acreage was planted. Under such conditions the impact of weather variability on the world market would be minimized.

If long term supply and demand were in balance the smoothing effect of the yield storage rule on quantity would result in a stability of domestic consumption and a stable supply for export. Such a stocks management policy would minimize the impact of domestic weather variation on commodity prices. All other factors would be reflected in the market including demand and supply shifts as a result of technology or changes in financial or macro policy variables. The effects of weather in importing countries and on competing exporters would be transmitted through the market to the extent that they did not follow the yield storage rule. Also the impact of their policies would be felt.

Reducing Risks need not Distort Markets

Farm commodity producers are subject to the risk of low levels of income because of the impact of weather and economic forces on the production, marketing consumption and prices of the commodities they produce. Because the input/output relationship is not fixed and the impact of weather is random in nature, the producers best expectation of the price for the next crop year is likely some average of historical prices. If resources are committed with the expectation of normal yields and prices and the output results in a significantly better or poorer crop, prices and incomes can be dramatically altered, although the producers planned appropriately given their limited information.

The basis for a stocks policy in a free market appears to be linked to the societal belief that farmers should receive some degree of protection from the random force of weather. Neither the Government nor the farmer can correctly anticipate or forecast the outcome of a specific crop at planting time except by chance, therefore, programs should be designed to be reactive to crop output rather than anticipate crop output.

With weather induced variability, current year market prices do not allocate resources to the production of commodities in an efficient manner in the short run because of the temporal dislocation of inputs and production and because output is to some extent random. In the long run, with storage of the yield surpluses, resources would tend to be allocated by output prices because long run market prices would be more easily determined.

Protecting farmers from downside income risks requires two forms of programs. One to protect individual producers from the loss of a crop due to random weather events that are localized in nature and another to protect all producers from the price depressing impact of an exceptionally large crop.

Providing protection against random shocks to the system need not distort long-term market signals if the shocks are not the result of economic forces. That is, if they are due entirely to weather. However, if income declines as a result of a change in the business cycle, providing price protection against the shift in demand will result in commitment of more resources in production than would be required. Or, if demand shifts as a result of a change in foreign exchange rates, establishing a price floor could result in a greater reduction in trade than would result from a market determined price.