

Cattle Inventory Adjustments

Crom (1981) listed seven factors that can influence the severity of biological and economic effects on a cattle cycle: weather, feed grain exports, feed prices, consumer income and expenditures, inflation, changing consumer preference, and the structure of cattle feeding. Inflation had a tremendous effect on many aspects of the economy, including the cattle sector in the late 1970's and early 1980's. These factors combined in the 1970's in a way that made that cyclical downturn one of the most extreme since the 1950's (Crom, 1981). Some authors attribute the shortened expansion phase of the 1980's cycle to sharply decreased demand for beef (Purcell, 1996), while others give more weight to various supply-side events, including drought, conversion of pasture to cropland, and the effects of high interest rates on production costs. These same factors, or closely related variations, appear to have deepened the downturn of the 1990's cattle cycle.

Weather Effects

Weather's main effects are on pasture, forage production, and crop production (Rucker, Burt, and LaFrance, 1984; Crom, 1981; and Arzac and Wilkinson, 1979). The more widespread the weather effects, the more widespread and severe the cyclical responses. If snow or rainfall is below average in many areas, available pasture is reduced during the grazing season, which is generally May through September in the midplains, a longer season farther south, and a shorter season farther north in the United States. Drought can begin to reduce available pasture anytime during the grazing season, and when that happens, cattle producers have two options: They can sell cattle to bring their grazing requirements into line with their available pasture and forage resources, or they can feed supplemental harvested forages. Either of these alternatives has further negative shortrun effects on the beef cattle operation. Rucker, Burt, and LaFrance (1984, p. 139) observed that hay production was better than hay prices as an explanatory variable in their dynamic model of cattle inventories, primarily as a measure of winter feed availability, but also as a measure of the quality of pasture and range conditions--as affected by weather--and a measure of the intermediate-term commitment of resources to cattle production. It is interesting that Rucker, Burt, and LaFrance failed to get significant responses from prices of other feedstuffs (p. 141). Other studies have found significant, though not always large, effects from grain and feedstuff prices (Arzac and Wilkinson, 1979, pp. 299-302).

If operators choose to remove cattle from pastures, they disrupt their normal timing of cattle sales or cash flow, selling younger cattle at lighter weights. These premature cattle sales combined with planned sales mean more cattle going to market than normal. With demand fixed or slowly changing, increased sales volumes exert downward pressure on prices, which, combined with reduced weights per head sold prematurely, translates into lower receipts for cattle producers. At this point in a cattle cycle, one often observes a narrowing of the differential between lighter calves and yearlings and heavier calves and yearlings.

The normal price relationship between lighter calves and yearlings and heavier calves and yearlings is for lighter, younger calves to sell at higher prices per hundredweight (cwt) than heavier, older calves. This happens because lighter, younger cattle generally gain more on a given amount of feed than heavier, older cattle. When feed is relatively cheap compared with cattle prices, producers can make more money by buying lighter calves and feeding them longer. When feed is relatively expensive, producers make more money by buying heavier cattle that will not require as long a feeding period. On occasion, the differential has been reversed and the lighter cattle actually sold at a lower price per cwt than the heavier calves and yearlings.

Drought effects are often manifest in late spring or early summer, as in 1996, but can happen at other times, depending on pasture and range conditions. For instance, during a winter drought, wheat pasture in the southern Plains may be affected, causing cattle to move to feedlots during the winter or even late fall at lighter weights than otherwise. If operators choose to feed supplemental forages or other feeds, their operating costs increase. The increase comes from increased quantities of feed fed to livestock and often concomitant higher prices for hay, other forage, grain, and other feedstuffs from increased demand and drought-induced lower supplies.

Grain and Beef Trade Effects

Grain exports and livestock exports and imports are increasingly important factors affecting cyclical variations in cattle numbers and prices. During cyclical peaks in cattle inventories, even ordinary numbers of cattle imports can appear extremely burdensome. Arzac and Wilkinson (1979, pp. 304-305) observed transitory and permanent effects of corn exports on beef and cattle prices. Beef imports have also been demonstrated to have an inverse relationship with domestic cattle prices. Mundlak and Huang (1996) concluded that "relative sizes between "price peak" and "supply peak" agree with how foreign-trade-oriented [a] country's beef industry is" (p. 868). However, as one might expect, given the manufacturing quality of beef normally imported, only minor effects are reported for fed beef and high-quality cattle, most of the effects being on nonfed beef and cow prices (Freebairn and Rausser, 1975, pp. 685-686).

Cropping and Commodity Program Effects

In addition to effects of the international grain trade, U.S. commodity program policies affect the cattle cycle by motivating substitutions between cropland use as cropland or as improved pasture. Further, Bobst and Davis (1987) suggest and provide evidence that cattle numbers fluctuate in an inverse relationship to changes in the number of harvested crop acres--a finding consistent with Rucker, Burt, and LaFrance (1984). Bobst and Davis estimate that beef cow numbers would decline by 36,600 head for every 1-million-acre increase in productivity-adjusted harvested cropland. They attribute "the explanation of why beef cow inventories broke away from their usual cyclical pattern in the 1980's" to substitution of cropland for pasture and rangeland and the rapid expansion of cropland during this period (p. 774).

Beef Industry Structure Effects

Changes in the characteristics and technologies of not only cattle feeding, but in cattle production and cattle slaughter as well, have had an effect on more recent cycles. For instance, increased average cattle weights have coincided with the building of new slaughter plants able to handle larger carcasses (or vice versa). This is especially noticeable since the 1970's, which were characterized by relatively stable slaughter weights because older packing plants were somewhat constrained in the size of carcasses they could process. In the early 1980's, an influx of new and updated packing plants stimulated a rather large increase in average cattle weights. Increased weights have caused the last two cattle inventory cycles to fluctuate around what appears to be a slight downward trend. This is a reversal of the uptrend of pre-1970's cycles, even though beef production has generally trended upward for several decades.

Demand Effects

Finally, consumer income and expenditures and consumer preferences for competing meats, or for no meats at all, are demand factors having increased effects on beef's market share of the consumers' meat expenditures and cattle cycles. Per-capita beef consumption (pounds of carcass beef per person) increased slightly after World War II, and has been relatively constant for most of the last 40 years. However, the large cyclical buildup in cattle inventories during the 1970's caused a temporary upward jump in per-capita beef consumption measures. So, looking at data for the last 25 or 30 years leaves one with the impression that per-capita consumption is declining. In addition, since 1986, more fat is trimmed off primal cuts of beef than before, shifting quantity measures slightly lower and contributing to the impression that beef consumption is declining. Even though per-capita beef consumption has remained relatively constant, beef's market share has declined since before the 1970's as per-capita poultry consumption has increased.