

Characteristics of Cattle Cycles

Many agricultural commodities exhibit cycles, that is, some quantifiable characteristic, like size, prices, or numbers, that increases to high levels, reaches a peak, declines to a low level, and then repeats the fluctuating pattern. In nature, cycles occur because the biological lags encounter biological constraints, such as maximum carrying capacity of a species' habitat, an increase in a predator species, or other limiting natural phenomena. When the environment is constant, these life cycles are relatively uniform and vary, depending on the time it takes for individuals within each species to reach each stage in its life cycle. When taken over whole populations, these life cycles generate longer population cycles that we recognize by various names, like the cattle cycle. When the environment is not constant due to drought, disease, or other phenomena, large variations in the regularity of these cycles can occur.

In agricultural commodities, economic phenomena often provide the limits to commodity population inventories. Cycles in supplies and prices of agricultural commodities occur because of the aggregate effects of interactions between the limits imposed by nature and the economic environment and biological lags in life histories of agricultural commodities. At least in this century, and likely for much longer, cycles in agricultural prices and profits have occurred while cyclical supplies faced a relatively constant or slowly changing demand.

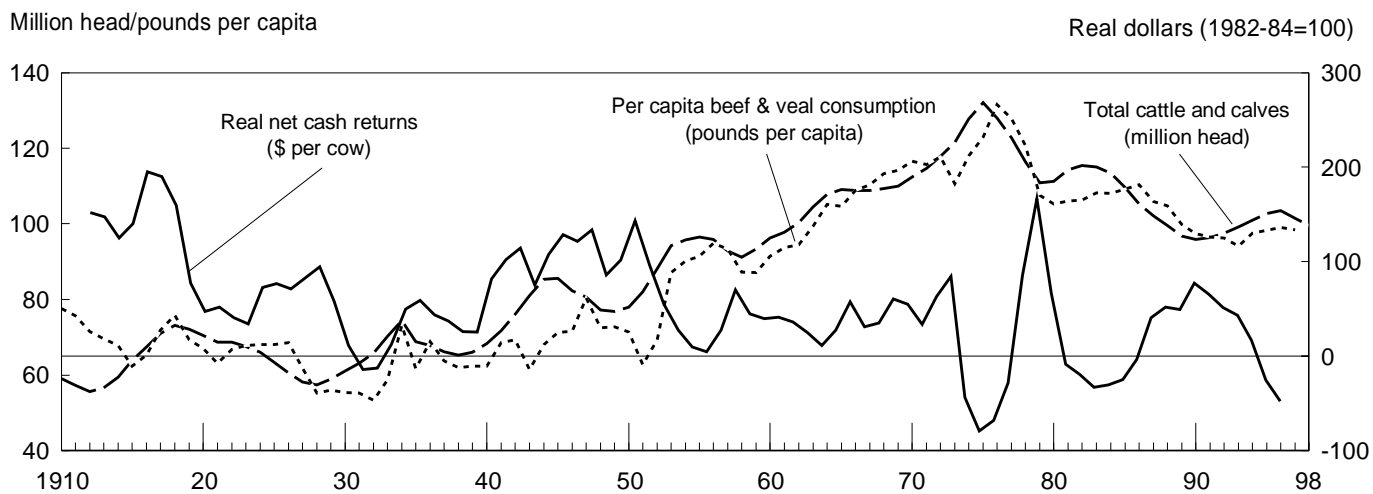
The environment in which the cattle cycle operates includes variations in economic activities in addition to the natural and biological factors that influence the length of cattle cycles. Earlier studies attributed cyclical behavior in cattle numbers to weather, grain exports, government programs, and other factors in addition to biological lags (Rucker, Burt, and LaFrance, 1984; Crom, 1981; and Arzac and Wilkinson, 1979). Cyclical fluctuations in U.S. cattle numbers have been observed since at least 1867.

The cattle cycle lasts about 10 to 12 years (Mundlak and Huang, 1996, p. 858; Trapp, 1986, p. 699; Crom, 1981, p. 1; and Franzmann and Walker, 1972, p. 507). It consists of about 6 to 7 years of expanding cattle numbers, usually followed by 1 to 2 years in which cattle numbers are consolidated, then 3 to 4 years of declining numbers before the next expansion begins (Crom, 1981, p. 1). However, economic factors or natural factors can shorten or lengthen the whole cycle or any of its phases (fig. 1). Cattle inventory numbers began to climb just after the Civil War and continued to climb for about 23 years before reaching a peak in 1890. Cattle numbers then declined until 1895, when the next expansion began. The expansion that began in 1896 peaked in 1904, a period of 8 years, then declined until 1912, a cycle of 16 years from inventory low to low. The cycle of the 1980's lasted 10 years from low to low, but the expansion phase lasted only 3 years. The periods of time between cyclical peaks or lows in cattle numbers have shortened over time.

Cattle prices also fluctuate during cattle cycles, but have their own patterns, somewhat but not perfectly correlated with cattle inventories. Mundlak and Huang (1996) observed that, while cow stocks and slaughter showed distinct 10-year cycles, prices showed a different pattern. One peak for slaughter prices appeared at 11 years and another much more apparent peak at 22 years (their fig. 1, p. 859). These peaks coincided with cattle cycles in the 1950's and 1970's, two of the more extreme cattle cycles of recent decades.

Figure 1

Total U.S. cattle and calves, real net returns per cow, and per capita beef and veal consumption, 1910-98



Note: Costs exclude capital replacement.
Source: USDA, ERS.