

Managing for Today's Cattle Market and Beyond

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Should Producers Attempt to Behave Counter-Cyclically During Cattle Cycles?

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Introduction

Cattle cycles refer to the relatively predictable rise and fall in US cattle inventories over a period of years (normally 9-13 years) that have characterized the US cattle market since at least the mid-19th century. Cycles are a well-known phenomenon in cattle markets and are attributed to the lengthy biological lag which exists between when price signals are experienced and when an appropriate increase or decrease in beef production occurs.

Prices tend to vary inversely (though not perfectly) with cattle numbers, meaning that as inventories decline (increase) in cattle cycles, prices are expected to increase (decline). This raises the question of whether producers can take advantage of the cattle cycle by behaving counter cyclically. Counter cyclical behavior basically means that producers would retain more heifers and/or cows than usual when cattle inventories are at or near the high point of the current cycle under the assumption that prices will soon rise and would sell more heifers and/or cows than usual when cattle inventories are at or near troughs in the cycle assuming that prices will soon decline.

Economists sometimes encourage cattle producers to try to behave counter cyclically. Beale et al. (1983), for instance, strongly advocated that producers develop management strategies over the

cattle cycle and offered explicit instructions on how to do so. In trade publications, such as the *Western Livestock Journal (WLJ)*, the message to ranchers is frequently one to try and “time” the market¹ (e.g., the April 3, 2000 Market Advisor column in the *WLJ*). Trapp (1986) suggested that the best strategy for ranchers to follow was to build up herds on the upside of the cycle and to reduce herd sizes on the downside of the cycle.

However, recent research completed by Rosen et al. (1994) suggests that cattle cycles are the direct result of the behavior or forward-looking, profit-maximizing ranchers. However, Rosen et al. made the assumption that all cattle producers have similar costs and that all react the same to market signals.² Obviously cattle producers have different costs and may react differently to market price signals, but the work by Rosen et al. and others raises questions about whether producers can behave counter cyclically and improve profits.

Hamilton and Kastens (2000) suggest that cattle cycles can be influenced by market timing. They believe that cattle inventories are influenced by producers attempting to act counter cyclically as well as by prices and biological lags. If so, at least some producers are trying to time the market because they believe they can increase profits by doing so. Is it possible for producers to make more money by timing the market and what conditions need exist for them to

do so? In this article, we attempt to describe some of the market conditions and producer situations that might make a market-timing strategy more profitable than simply making decisions based on current market prices. We also describe some of the barriers producers might face in attempting to behave counter cyclically.

Possible Factors Providing Incentives to Act Counter Cyclically

Since economic models using representative producers (e.g. Rosen et al.) suggest that ranchers cannot behave counter cyclically and increase their profits. They also indicate that any rancher who can be more profitable using a counter-cyclical strategy must not be “representative.” This may be obvious but it points out that producers must have different costs or behave differently than most producers when faced with similar market conditions if market timing is to be a valid strategy. This must be true since if all producers were willing and able to behave counter cyclically, the cattle cycle would disappear.

Some factors that might provide incentives for some cattle producers to behave differently than other producers include 1) having a significantly lower cost to produce calves than others, 2) holding an opinion that prices for female cattle near the top (bottom) of cattle cycles are undervalued (overvalued), or 3) having a different attitude toward risk than other producers. Each of these possible incentives will be discussed below.

Producers with Low Costs of Production

The per-unit (per-cow) costs of production for cattle producers in different parts of the United States is quite different. For example, Figure 1 shows production costs during 1996-97 on a per bred beef cow basis for four regions defined by USDA, ERS. The four regions were defined as the Plains (KS, NE, ND, OK, SD, TX), the West (CA, CO, ID, MT, OR, WY), North Central (IL, IA, MO), and Southeast (KY, FL). The Plains Region had the lowest production cost while the West had the highest production costs per bred beef cow. If one assumes that producers with low production costs can take advantages of cattle cycles and if the relative relationships between costs in the four regions have held for some time, then one would expect the number of beef cows in the Plains region to

be increasing relative to beef cow numbers in the other regions. Figure 2 reports relative beef cow numbers in the four regions between 1970 and 2000. Using the number of beef cows in the Plains region as a base, beef cow numbers in the other three regions are divided by the number of beef cows in the Plains region. Figure 2 shows that little has changed in the relationships between beef cow numbers in these four regions during the past 30 years. Relative beef cow numbers in the North Central region (one of the high cost regions) have declined somewhat compared to the Plains region, but relative beef cow numbers in the West (the highest cost region) have actually increased slightly between 1970 and 2000. This suggests that the relative level of investment in cattle inventories in the four regions has remained relatively constant over time in spite of difference in production costs. While further work is needed to examine these relationships during cattle cycles, the results suggest that in general, producers in low cost regions have either been unwilling or unable to capture more market share by using their cost advantage to behave counter cyclically.

Figure 1. Average Economic Costs Per Bred Beef Cow in Selected ERS Regions, 1996-97.

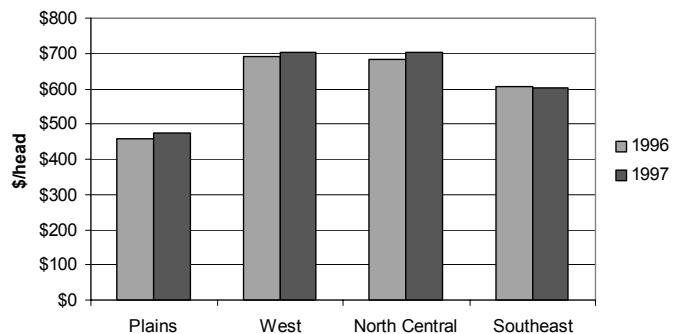
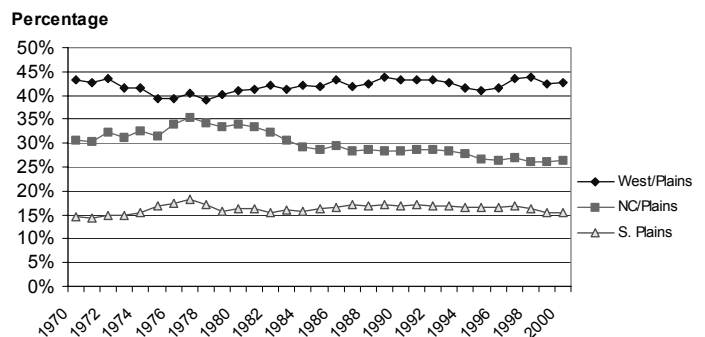


Figure 2. Beef Cow Numbers in Three Regions Compared to the Plains Region, 1970-2000.



Are Female Cattle Valued Incorrectly During the Cattle Cycle?

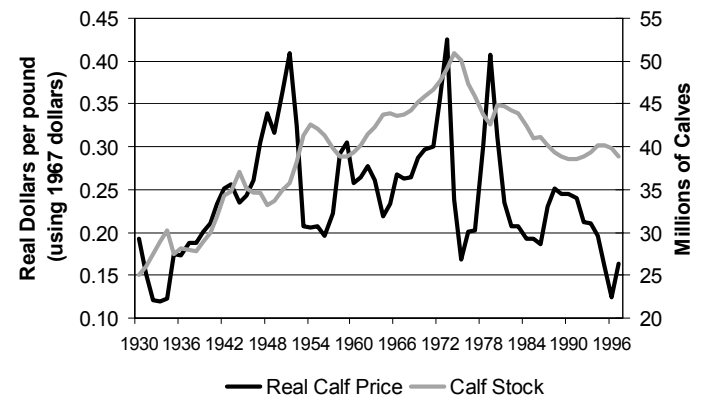
Counter cyclical behavior indicates that some market inefficiencies may exist since it implies, in general, that female cattle can be purchased or retained for less than their true value near the top of cattle cycles and/or sold for more than their true value near the bottom of cattle cycles. This is a general statement since different buyers have different values they place on females at each stage of the cycle since their marginal value products for females are not equal. This is because buyers have different costs and price outlooks. However, economic theory states that the value of a female cow is equal the net present value of calves she will produce during her lifetime plus her discounted cull (salvage) value less her discounted carrying (production) costs (Aadland and Bailey). If market inefficiencies do exist which reward counter cyclical behavior it implies that a consistent downward (upward) bias exists in buyers price expectations for calves and/or cull cows near the top (bottom) of cattle cycles that sellers can take advantage of this bias. The authors are aware of no economic research confirming that such a bias exists or not. Consequently, this is an area where further research is needed to determine if counter cyclical behavior could be profitable.

Producers with Differing Attitudes toward Risk

Economic research indicates that cattle prices follow cycles just like cattle numbers follow cycles (Mundlak and Huang). However, price cycles are not mirror images of inventory cycles (i.e., do not rise at precisely the same time inventories fall or vice versa). This is illustrated in Figure 3 where the US calf inventory (stock) is graphed against real US calf prices between 1930 and 1997. Real prices are calculated using 1967 as the base year. From Figure 3 we see clearly that calf inventories have followed a regular cyclical pattern which is repeated approximately every 10 years. Calf prices also appear to display a cyclical pattern, although a much less regular one than calf inventories. Although there were periods such as in 1954, 1959, and 1979 when peaks (troughs) in calf numbers corresponded approximately to troughs (peaks) in calf numbers, there are also other times such as in 1943, 1973, and 1986 where the opposite was

true. The reason for these inconsistencies is that the demand and supply for beef (and, consequently, cattle) is not always stable and shocks (shifts) to supply and demand affect the inventory and price relationship.

Figure 3. Calf Stock vs. Real Calf Prices.



What does this imply about the possibility of a producer adopting a counter-cyclical strategy? We suggest that it may be rational for a risk-averse producer to not attempt to time the market. To be successful in a counter cyclical strategy, producers need to be able to forecast with a reasonable degree of certainty, the future path of prices during a cattle cycle. This is difficult for a couple of reasons. First, every inventory cycle is different. Although inventory cycles are fairly regular lasting approximately 10 years, some cycles have been as long as 15 years and some as short as six years. Second, supply and demand shocks are continuously hitting the market making it difficult to judge price movements purely by changes in cattle inventory.

Conclusions

Although different economists have suggested that cattle producers should behave counter cyclically, it is a strategy that has never been widely followed by producers. This article reports recent economic research which implies that profit-maximizing behavior of producers generates cattle cycles. This suggests that counter cyclical behavior is not expected to generate greater profits than cyclical behavior. We describe some conditions that might lead producers to follow and profit from a counter cyclical strategy. These conditions include having lower production costs than most other producers, the existence of a bias in price expectations for female cattle, or producers who are more willing to accept risks than others.

The fact is that counter cyclical behavior does not appear to be a general practice and has not been successful in dampening cattle cycles. More research is needed to determine conclusively whether some producers can profit from counter cyclical behavior or not.

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¹ "Timing." is defined by Hamilton and Kastens in a February *American Journal of Agricultural Economics* article as the "incentive . . . to deviate from the aggregate movement of the cycle by behaving 'counter cyclically.'"

² This means Rosen et al. used a "representative" rancher in their model and assumed all other ranchers had basically the same costs and reacted the same way to market conditions.