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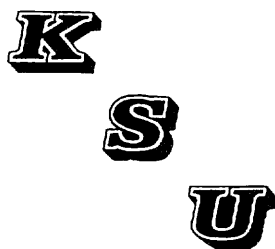
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MARKET HOG PRICE DISCOVERY

T. C. Schroeder¹ and J. Mintert¹

Summary

Cash hog markets are declining in importance, and use of formula pricing of market hogs is increasing. Producers need more information to assist them in price discovery and formula price negotiations with pork packers. Lean hog futures and pork wholesale plus by-product values offer useful pricing information for producers. However, using these markets as sources of price information is not without challenges. This report highlights issues involved in hog market price discovery and examines the usefulness of lean hog futures and wholesale pork values in price discovery.

(Key Words: Price Discovery, Hog Prices.)

Introduction

Price discovery is an issue of considerable concern in the hog sector. Once common, local, hog-buying stations are rapidly being replaced with noncash methods of trade including contracts, marketing agreements, alliances, and formula pricing arrangements. As this occurs, cash hog market volume declines, cash price data become less readily available, and the representativeness of prices quoted from cash transactions become increasingly suspect. What are the consequences of cash hog markets disappearing? How will this impact price discovery for hog producers? This study examined these questions through analysis of alternative sources of price discovery information in slaughter hog markets.

Procedures

Weekly values for cash hogs, lean hog futures, wholesale pork, and pork by-products were collected over the 1991-July 1999 period. Analyses of the relationship between live hog prices and futures and wholesale prices were conducted to determine how viable these alternative markets are as price sources for producers involved in either cash hog price discovery or negotiating formulas for marketing agreements.

Results and Discussion

Market hog pricing methods have changed considerably over the past decade. Cash markets are disappearing, and formula pricing agreements are becoming common. Formula pricing refers to situations where the price for a particular transaction is based upon an external reference price, and a formula incorporating the external price is used to establish the transaction's price.

A survey of 12 leading pork packers in January 1999, conducted by the University of Missouri for the National Pork Producers Council (NPPC) determined that only 35.8% of hogs were purchased on a cash market basis. The remaining 64.2% of the hogs were procured using noncash methods, up from 56.6% in 1997.

The upward trend in contract and formula pricing is primarily a result of benefits accruing to both buyers and sellers from entering into marketing agreements. These benefits include reduced costs for both buyers and

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sellers compared to discovering prices for each transaction and reduced search costs by both parties.

However, formula pricing also presents several potential problems. Formula priced hogs do not contribute to price discovery. Currently, formula-price arrangement terms are not publicly collected or disclosed by the USDA. As a result, formula pricing agreements are not visible to the market.

Formula pricing is also problematic if the external price used as a base in the formula is thinly traded or subject to manipulation. For example, agreements using recent local cash market prices (e.g., the previous week's price) for a base are concerns if the base is either thinly traded or, during some days or weeks, not even traded at all.

Despite drawbacks to formula pricing, its economic incentives for individual producers and packers are strong. The market environment is increasingly encouraging more formula or long-term noncash pricing methods. Therefore, producers need to better equip themselves to operate in this new environment.

As cash market hog prices decline in importance, market participants are considering other sources for base prices and/or pricing information. A couple of the more viable alternatives are 1) lean hog futures prices and 2) wholesale boxed pork and by-product prices.

Lean hog futures prices are appealing as a potential base price because they typically have a large volume of trade, rapidly reflect new information, are viable sources of price expectations, provide readily available price quotes, and are closely monitored to avoid manipulation. In addition, futures price-based formulas significantly increase opportunities for price risk management. That is, futures-based formulas provide producers with certainty regarding basis levels, which greatly reduces the risk of hedging hogs.

However, several concerns are present regarding the use of futures markets as an

external reference price. First, futures prices have a time-matching problem, in that they represent specific delivery or expiration dates that do not necessarily match the hog marketing date. Second, historical basis (cash price minus futures price) variability needs to be accounted for, if futures prices are to be used as a reference price source. Finally, if the cash lean hog market disappears, the lean hog futures market likely will face a similar demise.

To illustrate the relationship between a particular cash market and lean hog futures, the weekly Iowa - S. Minnesota (IA-SMN) hog price (converted to a carcass weight basis by dividing by 0.75) minus the nearby lean hog futures price (known as basis) is presented in Figure 1. The cash lean hog price varied from as much as \$7.00/cwt carcass weight greater than the nearby lean hog futures price to as much as \$15/cwt below the futures price.

A downward trend existed in the basis over the 1991-July 1999 time period. During the early 1990s, the cash price averaged roughly \$2/cwt carcass weight below the lean hog futures price, albeit with a lot of weekly variability. However, since 1996, basis generally has weakened, and the IA-SMN market hog price has averaged \$4.85/cwt carcass weight below the nearby futures price. This suggests that formulas based on lean hog futures would result in different and lower prices using recent years' basis values than futures-based formulas would have using basis values from earlier in the decade. Exactly why IA-SMN hog prices have declined relative to lean hog futures over time is not clear. However, one possibility is a change in the relative quality of cash hogs traded in the IA-SMN market. If higher quality hogs have moved away from cash market trade toward marketing agreements and lean percentage pricing arrangements, then the relative decline in cash market price may simply reflect this decline in quality.

Another possible external reference price to consider when establishing a base price is wholesale boxed pork cutout plus by-product

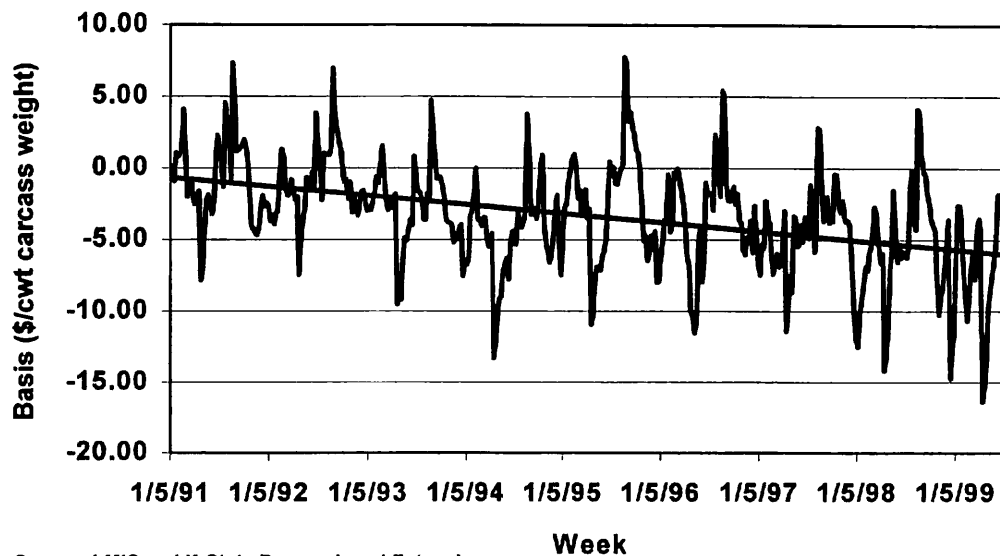
prices. Wholesale prices are appealing, because they potentially represent the market supply and demand for all meat products, whether they are going to retail, food service, or export markets. Although wholesale value-based prices are conceptually appealing, they offer several challenges from a practical perspective.

As slaughter and processing costs change, the relationship between wholesale and farm level prices also changes. Therefore, the relationship between unprocessed raw farm product and processed fabricated meat cuts varies. This was especially true in fall 1998, when demand for slaughter and fabrication services peaked and the spread between wholesale and live or carcass weight hog prices set a record.

The ratio of the weekly live hog price to the pork cutout plus by-product value has declined over the 1991 to July 1999 period (Figure 2). During the early and mid 1990s, the reported IA-SM live hog value per head was typically 85% to 97% of the wholesale and by-product value. In 1998 and early 1999, this ratio was generally less than 80% and dropped to approximately 35% in December 1998. It's premature to conclude that live values have shifted permanently to a lower level relative to wholesale values, because they recently have rebounded back to approximately 85% of wholesale values.

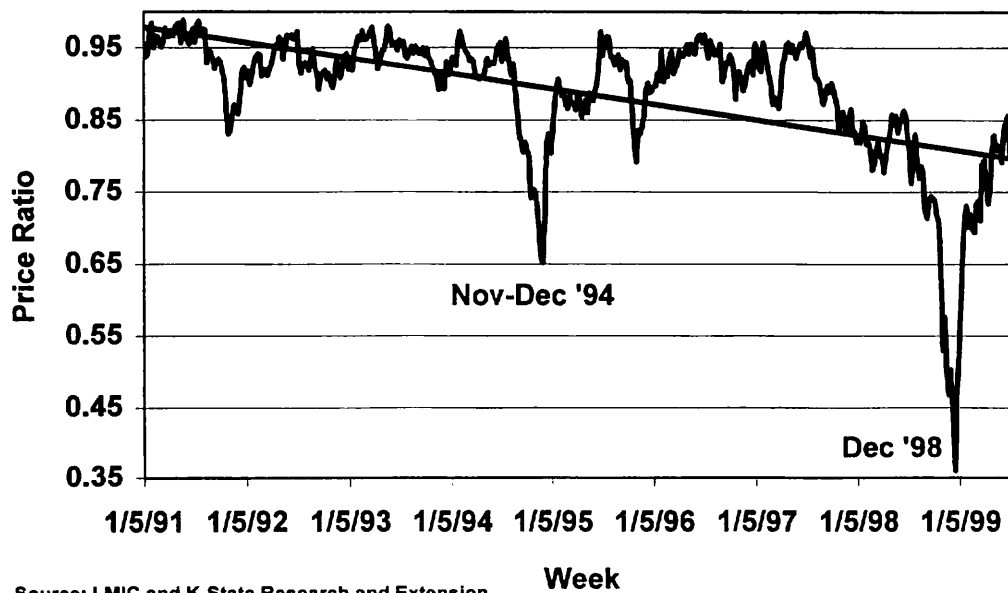
However, the variability in the ratio suggests that it will be difficult for pork producers to base prices purely off of wholesale values without allowing for variation in processing margins associated with changes in processor costs or industry processing-capacity utilization rates. This week-to-week variability in farm to wholesale pork price spreads is not necessarily a deterrent to wholesale-based farm-level pricing, if one is marketing hogs regularly so the weekly "peaks" in the spread are offset by the "troughs". However, using a particular week's wholesale value in a base price relationship may be more problematic for someone who markets hogs less frequently.

As cash hog market volumes continue to decline, hog producers will increasingly need to rely on other markets for pricing information and for establishing formula base prices. Two alternative markets to consider are the lean hog futures and the wholesale pork markets. However, use of either of these markets also presents challenges, because their relationships with live hog prices are not stable. Producers wishing to establish base prices off of either of these markets are encouraged to do additional analyses and design formulas that will help assure that the prices they are receiving are reflective of market conditions.



Source: LMIC and K-State Research and Extension

Figure 1. Weekly Iowa - S. Minn. Barrow and gilt Basis (Cash Price minus Nearby Lean Pork Futures Price), 1991 - July 1999.



Source: LMIC and K-State Research and Extension

Figure 2. Ratio of Weekly Iowa - S. Minn. Barrow and Gilt Value to Pork Cutout Plus By-Product Value (\$/head), 1991 - July 1999.