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Articles

Valuation of Transferable Delivery Rights for Marketing Cooperatives

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Delivery rights to a cooperative's marketing pool can take on a value independent of the members' equity share under certain conditions. Based on anecdotal information, transferable delivery rights become valuable when the pool is fixed in size (closed), members are protected from exploitation of quasi economic rents, and have an assured "home" for their production. The greater the potential buyers' aversion to risk, the higher the value of the delivery right. The right has additional value if the cooperative generates a premium per unit return due to product differentiation and market power. Cooperatives competing with investor-owned firms in less than purely competitive markets must be able to pay equal net returns to members if they are to survive.

Introduction

One of the unique characteristics and principles of the cooperative form of business is that members[1] provide the equity capital with which the assets of the cooperative are financed. Traditionally, marketing cooperatives obtain equity capital by deducting and retaining a small percentage of the net proceeds due the member obtained by marketing a member's commodity. At the time of exit from a cooperative, the cooperative member is typically refunded the equity capital over some period of time valued in the same manner as that in which it was paid, i.e., the book value of the cooperative. The member has, in essence, made a non-interest bearing subordinated loan to the cooperative based on either the use of the cooperative or a share of the cooperative's capacity. Thus, the member is not an investor in the traditional sense of an investor-owned firm (IOF) in that no appreciation of the cooperative's value is paid to the member.

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Schrader (1989) pointed out a strong desire on the part of cooperative members to increase the liquidity of their cooperative stock, especially as the members approach retirement. This created an incentive on the part of some cooperative members to attempt to restructure the cooperative in order to increase the stock liquidity. One method could be to sell the cooperative to private investors at the cooperative's market value if this value is in excess of book value (see Staatz 1987).

An alternative to selling the cooperative to private investors is to create a member property right based on the contractual right to deliver commodity to the cooperative and to allow members a limited right to sell and transfer this asset to other members or non-members under the condition that they obtain membership in the cooperative. This asset is separate and distinct from cooperative stock ownership and thus is separated from the equity contribution that a member makes to a cooperative.

A small number of cooperatives have created and recognized such an asset for their members. Secondary markets have been created that allow these delivery rights to be sold and transferred among the cooperative's members. There exists no direct cooperative intervention in these secondary markets although the cooperatives often provide information concerning the availability of these assets to members and non-members alike. The market exchange for these transferable delivery rights (TDR) is quite often the rural coffee shop.

Objectives

The primary objective of this study was to investigate how TDRs are valued in the secondary market. Specifically, the objectives were to:

1. Identify conditions under which a TDR can have value
2. Evaluate differing sources of TDR value

Procedure

There are a number of California and Pacific Northwest marketing cooperatives where secondary markets for TDRs have developed. Several of these cooperatives were contacted and asked to participate in this study. Three cooperatives agreed to participate. They provided the names of members who recently concluded transactions in the TDR secondary market.

A questionnaire was developed to elicit information on the factors that influenced the valuation of the TDR from the member's perspective. Personal interviews were conducted with 90 percent of the members who had bought or sold TDRs in 1992 and 1993. However, the sample size was considered too small and the cooperatives too heterogeneous to apply any time series or cross section statistical models to the data. All the empirical data used in this study is therefore anecdotal, and caution should be used in generalizing the results.

Secondary Markets for Cooperative Transferable Delivery Rights

The total delivery volume represented by a cooperative's TDRs is a function of the size of the cooperative's marketing pool. The original size of

the marketing pool is established by the cooperative using market and financial criteria. Each current member is then issued a proportion of the pool as a delivery right referred to as production base or simply base. The proportion received by the current member is typically based on the delivery history of the member. Each subsequent marketing year the cooperative, based on forecast demand and capacity utilization, determines the percentage of base that can be delivered by a member. If base is set at less than 100 percent of the initial base, producers must adjust their production of the commodity. If market conditions and capacity warrant an increase in the marketing pool, existing members receive additional base on a pro-rata basis.

A secondary market for TDRs is formed between sellers of TDRs who are current members of the cooperative and deliver commodity to the pool and other producers of that commodity who are either current members wishing to expand the amount of commodity they are delivering to the marketing pool or non-members who want to become members and deliver commodity to the marketing pool. It is postulated that the following set of conditions are necessary to form and sustain a secondary market in TDRs:

1. The TDRs are perceived to have value by the potential buyers
2. There are willing sellers
3. Transaction costs are small relative to the perceived value of the TDR
4. Cooperative membership and crop pools are closed
5. There are cooperative by-laws that allow the transfer of the delivery rights

The buyer of a TDR gains two potential benefits from the TDR: (1) a patronage right to deliver a specified amount of production to the cooperative marketing pool and (2) a right to share in the marketing pool net proceeds based on the proportion of the total marketing pool that the TDR represents. These two benefits give a potential patronage value to the TDR. The seller of a TDR receives patronage value for the TDR that is independent of the redemption value of the cooperative's stock.

Although TDR sellers were not interviewed, discussions with buyers indicated five possible reasons for offering a TDR for sale. First, the member wished to retire; second, land was being sold for non-farm use; third, a grower wished to change crop mix; fourth, a financially troubled grower needed to liquidate some assets; and five, the cooperative had expanded the base pool and had issued pro rata share in the form of TDRs. Perennial crop growers owning land fully planted sold these TDRs rather than purchase additional land. During the fieldwork, contact was made with an individual who had assembled several small TDRs and resold them as a single unit.

An important distinction is that cooperative membership results in cooperative stock ownership, while TDR ownership results in the patronage right to delivery commodity to the marketing pool and share in the net proceeds of that pool. Thus, it is the TDR that reflects the value of cooperative patronage, not cooperative stock ownership.

TDR value can be separated into two distinct components. The first component reflects the value of delivering commodity to the marketing

pool and is associated with the benefits a producer might derive from better coordination between production and marketing due to the existence of the cooperative (Shaffer 1987). Coordination includes a long-term contractual obligation to accept and market a commodity and other terms of trade developed and monitored by a grower-elected board of directors. This benefit was referred to as the "home for production" benefit by almost all of the cooperative members that were interviewed. This is in essence an "insurance value" for the TDR.

The second benefit reflects the value of payments made from the marketing pool (net proceeds paid to the member) above those that would be achievable from alternative buyers. This is termed the "premium return value" of the TDR.[2] A TDR can achieve market value by providing either or both of the above benefits to members.

It is hypothesized that existence of a TDR value, due to either or both of the above benefits, is a function of industry structure, the cooperative's competitive conduct in the industry, the behavior of the cooperative relative to its membership and marketing pool policies, and an individual producer's response to marketing risk and uncertainty. Industry structure is concerned with location, number, and relative size of firms in the industry. Cooperative competitive conduct in the industry refers to how aggressively the cooperative behaves relative to its competitors. That is, does the cooperative behave in an aggressively competitive or passive noncompetitive manner relative to other firms in the industry?

The cooperative marketing pool/membership policy is related to the issue of open or closed marketing pools and open or closed membership. For ease of explanation, we define two types of pool/membership situations. Open pool and open membership allow the addition of new members and their production to the cooperative pool and/or allow existing members to increase their delivery to the cooperative marketing pool. A closed membership and closed pool preclude any additional production being added to the cooperative marketing pool in the short run.

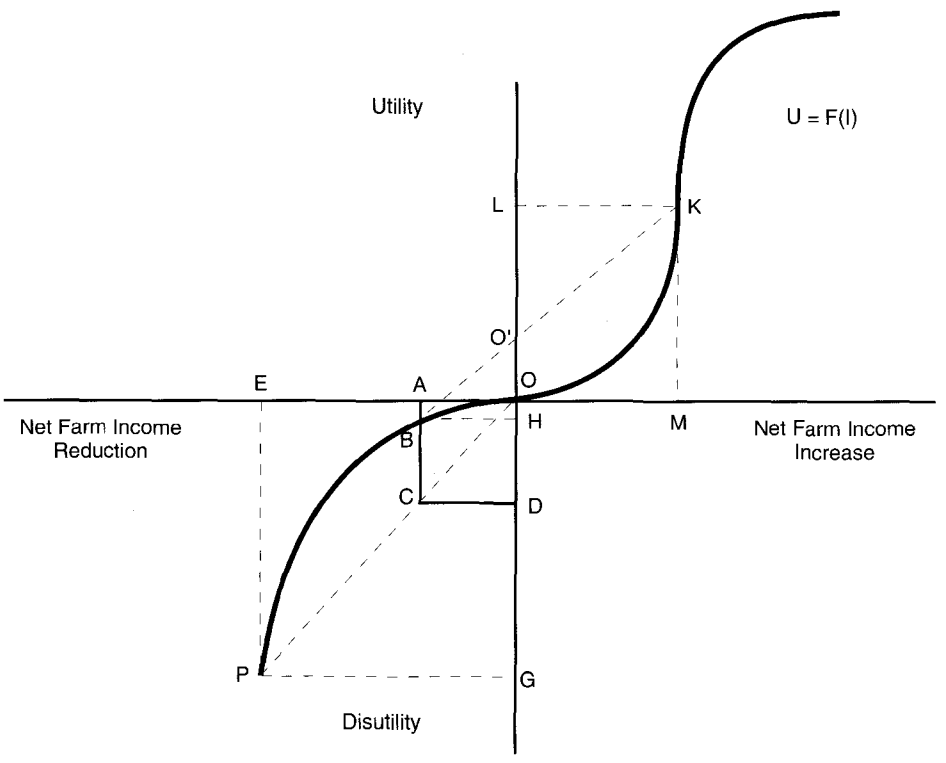
An individual producer's response to marketing risk and uncertainty is the final parameter to be determined. The basic problem facing producers is how to coordinate their economic activity in an uncertain world given that, for most agricultural production, there exists significant capital and market risk. We define the producer's problem as one of maximizing utility, given risk and uncertainty in the decision-making environment. Specific risks faced by the producer would include the basic production risks of yield and cost variability and the marketing risks of price variability and market coordination activities (market access, terms of trade, payment reliability, etc.).

The objective function is for the producer to maximize expected utility of farm income (Halter and Dean 1971; Anderson, Dillon, and Hardaker 1977). This involves determination of a producer's utility function with respect to expected net farm income and the variances and covariances associated with different production and/or marketing choices. The portfolio of choices may be limited by agronomic, financial, and/or institutional factors.

Figure 1 illustrates one possible utility function[3] for an individual producer making decisions concerning the purchase of a TDR. It can be used to demonstrate that the purchase of a TDR can increase a producer's expected utility from either the benefit of a "premium return value" or an "insurance value." Point O can be considered the initial farm income position for a producer. The horizontal axis then can be scaled to represent gains or a reduction in net farm income.

First, consider the individual producer who is contemplating the purchase of a TDR for its insurance value. This insurance value is associated with the marketing risks faced by the producer. These market risks include opportunistic behavior by IOFs; transaction cost reduction associated with search, negotiation, and enforcement costs of marketing contracts; and market access restrictions. A producer located at point O can purchase a TDR for a price of OA, or not buy a TDR with a probability p of net farm loss OE, or a probability 1-p of no loss and remaining at point O. The utility associated with buying a TDR (as an insurance policy) at a price of OA is read off the utility curve at point B or utility level H. The disutility

Figure 1.—Utility Function Showing Ranges of Both Decreasing and Increasing Marginal Utility



associated with not purchasing a TDR and incurring a loss is read off chord OF at point C and utility level D. The chord OF represents the expected disutility of not purchasing a TDR, which has two possible outcomes, either OE with probability p or O with a probability of 1-p. Probability p then represents the proportion of the total distance OE at which to read off the expected utility of OE from chord OF. Using the above notation, if p = 1/3 and OA is 1/3 the distance from O to E, then the utility of not buying the insurance would be 1/3 the distance from O to F. The above producer would clearly purchase the TDR since utility level H is preferred to utility level D.

Now consider the individual producer who is contemplating purchasing a TDR with the expectation that net farm income can be increased due to the purchase of a TDR. There is assumed to be some probability p that (1) the cooperative can provide to its members higher returns on their production than that which would be available from alternative firms and (2) a probability 1-p that the purchase of the TDR will result in the loss of net farm income due to the initial price paid for the TDR. There are two possible alternatives open to the producer: (1) remain at point O, or (2) buy the TDR with a probability of p that the outcome will be an increase of net farm income of OM or a probability of 1-p that a reduction of net farm income of OA will result. Analogous to the situation presented above, the utility of purchasing the TDR is read off the chord BK. Chord BK represents the two possible outcomes of purchasing a TDR. The disutility of a possible reduction in net farm income is H. The utility of the potential gain in net farm income is L. The utility of purchasing the TDR is O′, which is on the chord BK and is the weighted utility of H and L. Clearly, in this case the producer would buy the TDR based on this utility function because utility O′ is greater than utility O.

Producers are not precluded from purchasing a TDR that covers only a portion of their production. A producer who has a utility function such as shown in figure 1 could maximize expected utility by simultaneously purchasing an "insurance value" TDR for part of the production and "speculating" on the open market with the remainder of the production. It should also be noted that utility functions may take on other functional forms such as linear (risk neutral) or cubic (risk preferring), which will produce different results. The most common form is concave or risk averse throughout.

Transferable Delivery Right Valuation

Earlier it was hypothesized that TDR value, reflecting either an insurance value and/or a premium value, was a function of market structure, cooperative competitive conduct in the industry, the type of marketing pool, membership policies followed by the cooperative, and individual producer response to marketing risk. The above has demonstrated that, given a specified utility function and the probability of an opportunity to add to net farm income or diminish the potential loss of net farm income, an individual producer could maximize expected utility by purchasing a TDR. This section of the paper addresses the remaining issues that were hypothesized to be important in determining whether a TDR would have value

to an individual producer. This section postulates a plausible industry structure, cooperative competitive conduct, and marketing pool and membership policies that would lead a producer to believe that the probability of TDR value is positive.

Four TDR valuation cases are presented below. These cases are not intended to exhaust all situations in which TDR can have value but rather to provide situations in which TDRs could have value to a producer. Each of the cases presents differing combinations of industry structure, cooperative competitive conduct, and cooperative marketing pool and membership policies. The cases will be differentiated by the competitiveness or non-competitiveness of the commodity procurement market, the final product market, market conduct of the cooperative, and its marketing pool and membership policies.

Case 1

1. Procurement Market:	Competitive
2. Product Market:	Competitive
3. Cooperative Conduct:	Competitive
4. Pool/Membership Policy:	Open/Open

The competitive nature of the markets and the cooperative conduct would result in firms in the industry receiving a product price that just covers the industry long-run average cost (LRAC). The net proceeds that a cooperative member would receive in this case would approximate those received by non-members. If cooperative net proceeds were less than those received by non-members, the cooperative could expect to lose members and subsequently exit the industry.

Delivery rights, and thus TDR, have no insurance or premium return value either to existing members or non-members. This is because either can produce a commodity with the certain belief that there will be a willing buyer at harvest time at the industry average price.

Case 2

1. Procurement Market:	Competitive
2. Product Market:	Non-Competitive
3. Cooperative Conduct:	Oligopolistic
4. Pool/Membership Policy:	Closed/Closed

This case is similar to a large food processor that buys raw commodity in a competitive environment and has obtained some oligopolistic power in the product market through brand name development or market share. The product market is non-competitive. One cooperative in the study is approximated by this case.

The cooperative behaves as an oligopolist, and the remaining firms are assumed to conduct themselves in a competitive manner selling undifferentiated products or having relatively small market shares. Cooperative membership and marketing pool policy restrict delivery to the oligopolistic profit-maximizing level necessitating a closed pool/closed membership policy. This situation offers a potential for the TDR to have value. The net proceeds allocated to the individual members would exceed those that could be obtained from alternative firms. Thus, the probability of producers receiving a premium return on their production is significant.

The TDR value in this case is the capitalized value of the premium return value, which is defined as expected difference in the total net proceeds received from the cooperative less the opportunity cost of marketing through the next best market alternative available to the producer. This can be considered the value of production with and without the cooperative.

The valuation of the TDR in this case is similar to the valuation of IOF stock given the following assumptions. First, assume that the objective of the cooperative is to maximize the premium return component of its net proceeds and that, due to its non-profit status, it will distribute all net proceeds less any equity contribution to its patrons. Second, the variance of the net proceeds received from the cooperative (allocated net proceeds) is the same or smaller than payments that could be received from other firms in the industry.

The TDR value in this case is the capitalized value of the premium return value and can be calculated as follows:

$$TDR(0) = EPR(1)/Ks\text{-}g$$

where TDR(0) is the current value of a transferable delivery right, EPR(1) is the expected premium return value at the end of period one, Ks is the opportunity cost of capital, and g is the expected growth rate of the TDR.[4]

This relatively simple growth model reflects the comparative static situation with perfect information. It is not clear that potential buyers or sellers of TDRs who were interviewed had knowledge of the growth model or explicitly used such a model to determine TDR value (price), but "cooperative strength" in the marketplace and potential returns based on that strength ranked second in importance as a reason for purchasing a TDR.

The survey results also indicated that some buyers of TDRs recognized a potential growth rate for the TDR and recognized there was an opportunity cost of capital in purchasing a TDR. Thus, producers took into account the variables included in the growth model when determining TDR value. An important factor that stood out in the anecdotal information from the grower surveys was the wide range in beliefs expressed regarding the variability of the EPR. Some producers extrapolated from a time series going back as much as twenty years while younger and more cautious producers relied on more recent results. Due to the small sample size, these results cannot be statistically verified; however, there is a strong indication that a distribution of expected premium return values exists in the supply region of the cooperative.

The derived demand for the TDRs becomes the capitalized value of these expectations aggregated over the distribution of optimists and pessimists in the supply area. Since TDRs are not publicly advertised, the bringing together of buyers and sellers (containing both optimists and pessimists) in such an informal market contains an element of chance. The market exchange in many instances is the local gathering place for the area's producers—typically, the rural coffee shop. It is in this setting that the "reasonableness" of the TDR selling price is discussed and price discovery takes place.

Divergences in the price of a TDR for a specific cooperative do exist in these markets. This is partially explained by the fact that the supply area for any cooperative can be quite large and, although within one small geographical area there may exist a consensus on TDR price, there can be differences in TDR price among local geographical areas. This would indicate less than perfect information within these secondary markets, and the transaction costs of obtaining better information is perceived to be quite high.

Case 3

Procurement Market:	Local Oligopsonistic
Product Market:	Competitive
Cooperative Conduct:	Non-Competitive in Procurement
Pool/Membership Policy:	Closed/Closed

This case is probably the most frequently observed of the cases to be presented here and closely resembles two of the cooperatives in this study. This situation occurs when a local production region has a large number of producers and a relatively small number of firms in the procurement market. An example would be a production area producing fruit or vegetables for local food processors. The food processors compete in regional or national product markets and are assumed to act in a competitive manner in those markets receiving like prices for their products. Entry into the local market is constrained by economies of scale barriers.

In this case, the finished product has little, if any product differentiation. The procurement market is dominated by the cooperative in the geographic sub-areas, but this dominance could be shared with a small number of IOFs. The primary justifications for forming the cooperative were to capture economies of scale in processing and marketing, savings from vertical coordination, and to prevent the appropriation of quasi-economic rents by IOFs.

Potential commodity supply to processors is assumed to be greater than commodity demand at a price that would cover long-run average cost. The crop must be harvested and processed quickly or lose its value. High transportation cost precludes shipment to other processing areas.

TDR valuation, under the conditions proposed above, can be divided into two distinct producer decisions. The first decision relates to the determination of how to market a perishable perennial crop, while the second relates to the whole-farm planning problem of choosing a portfolio mix of perishable and non-perishable annual crops to produce and market.

Subcase 3A: TDR Valuation of a Perishable Perennial Crop

Williamson (1981) notes that, as assets became more specialized or "specific," autonomous market contracting becomes a progressively less efficient means of allocating these assets. This is known as the asset fixity principle. This "principle" suggests that, as producer assets become more specific to an end use or product, the cost of transferring these assets to other uses becomes prohibitive. The cost may reflect the technical characteristic of the asset itself, the spatial distribution of production, or poorly functioning factor markets. Producers owning these specialized assets will

continue to maintain them in their current use as long as their value in use exceeds their salvage value.

A good example of this asset fixity problem is the production of a perennial crop (trees, vines, etc.) in a specific geographic location where production has required a large farm investment in trees, vines, or other fixed assets and requires specialized skills. The procurement market as specified in this case provides the necessary condition for the asset fixity principle to apply and would allow local processors to act in an opportunistic manner (Klein, Crawford, and Alchian 1986).

Opportunistic behavior by processors can result in inefficient market coordination and cause producers to receive less than a competitive price for their output resulting in a situation where producers are in a position of severe income risk. This income risk can be viewed as an attempt by processors to appropriate a portion of the producers' quasi-economic rent. Whether this type of opportunistic behavior can be sustained over a long period of time is debatable; even in the short run, producers will attempt to defend against this opportunistic behavior.

A number of remedies may be possible such as a producer bargaining association or vertical integration to form a processing/marketing cooperative. This is especially true in markets where there are high sunk costs, a highly perishable product, and product demand is static or declining because existing processors have little concern about other IOFs entering the market.

This market failure situation provides a strong economic and societal rationale for the formation of a vertically integrated open pool/open membership cooperative. Vertical integration removes the opportunity for exploitation and provides a dependable outlet for the area's producers. Assuming the cooperative receives the same market price for its products as the IOF processors, and that it operates in an economically efficient manner, it will return to the area's producers a competitive return on their cooperative investment. Additionally, producers may benefit from improvements in market coordination activities. These market coordination benefits can include better terms of trade, enhanced opportunity to capture the upper end of the total income payment distribution, and increased producer confidence that they will be treated in a fair and honest manner.

Terms of trade benefits result from the reduction in the search, negotiation, and enforcement costs associated with establishing a market contract (Williamson 1981). The cooperative contract, unlike a typical IOF contract, has an indefinite length and doesn't have to be renegotiated every year. Contract cancellation is rare. Other favorable terms of trade may be offered such as cooperative assistance in handling off-quality production and providing logistics support.

Cooperative marketing contracts often require the cooperative take the producer's total production. Since these contracts are written in terms of acres of production, the producer is assured an outlet for total production even in bumper crop years. These cooperatives maintain excess capacity or rent temporary storage in bumper crop years. Increasing marginal and average costs may result in lower per unit net returns, but the upper end

of the total income stream distribution, due to increased yield, will not be truncated. This is a substantial benefit because many IOF contracts in the western United States are written for a specific quantity of production (tons, cwt., etc.), and when high yields occur, the producer must find a market for the additional production or see it spoil.[5]

The trust and confidence benefit comes with the knowledge that the cooperative is a user-owned and user-controlled entity. Members can exert political influence through the board of directors to be assured that they are receiving complete market information, that allocated net proceeds accurately reflect market conditions, and that every member is being treated equitably. These market coordination benefits are difficult to quantify but collectively can result in a reduction in the variability of producer income.

Only by closing its pool and membership can a cooperative create a secondary market where its insurance value can be capitalized into a TDR value. However, this action contributes to the same limited market access, asset fixity, and market coordination problems that the cooperative was originally formed to eliminate. The most often stated reason given by cooperatives for closing their marketing pool and membership is to provide their members with a competitive return comparable to that paid by IOFs.

Cooperative closure of its marketing pool/membership also provides the opportunity for existing cooperative members to capture the cooperative's insurance value through a TDR market. In this case, cooperative patronage now has a capitalizable insurance value that is a competitive "home for production" value. This competitive "home for production" value is derived from the limitation of opportunistic exploitation of IOF processors through vertical integration and the benefits of improved market coordination activities. The choices faced by non-members are to either form an additional cooperative, negotiate a long-term contract with the IOF processors, or buy a TDR from an existing cooperative member.

Subcase 3B: TDR Valuation of a Perishable Annual Crop

The producer in a localized production area is assumed to have the flexibility to produce a number of crops. For example, the potential crop mix could include perishable processing vegetables, field crops, seed crops, and perennials. The assumptions concerning market structure and market supply and demand remain the same. Production of perishable processing vegetables is limited either by IOF processor production contracts or a cooperative delivery right. The issue of asset fixity for producers choosing to grow perishable processing vegetable crops is not as important as in the case of perennials because production typically is not associated with large sunk investment costs or the use of specialized assets. The asset (perishable crop) does not become specialized until after planting.

The producer's problem is choosing which crop or combination of crops to produce when there is limited market access. Determination of the optimal cropping mix is known as the whole-farm planning problem (Anderson, Dillon, and Hardaker 1977). The objective is to find a cropping pattern that maximizes expected utility, given the producer's risk preferences rela-

tive to expected farm income, and the variances and covariances associated with the production and marketing mix choices.

This choice set can be limited by agronomic, operating capital, and market access considerations. Agronomic considerations might include crop rotations necessary for yield loss protection or physical input limitations (e.g., water availability). Limited operating capital will affect ability of producers to take certain production or marketing risks (Moore and Snyder 1969).

The valuation of a TDR for a perishable annual crop in this case is similar to that of a perishable perennial but emphasizes market access and the terms of trade security value of the cooperative. Producers of annual crops can adjust their crop mix much easier than those producing perennials, thus eliminating the asset fixity problem. Thus, the threat to the processors that producers will shift to alternative crops will limit their opportunistic behavior. Market access and favorable terms of trade provide the TDR value in this market situation. Market access allows producers to grow processing vegetable crops rather than forage, seed, or other crops that can have lower expected income and/or greater variance of income. This same market access may also provide for a decrease in the variance of the farm income stream when income covariances are negative. The benefits from the cooperative's terms of trade are similar to those for a perennial. Risk of contract cancellation is zero as long as cooperative membership is maintained. Finally, many growers feel more confident as part of a cooperative. They tend to worry less about the disposition and payment for their crop than they would with an IOF processor. Again, many of these benefits are hard to quantify, but all are sources of value for a TDR.

The anecdotal information collected in the survey strongly indicated that risk aversion was an important motive for purchasing a TDR. The result compares favorably with the discussion relating to figure 1. That is, a producer has an incentive to purchase a TDR if there exists a probability that it will reduce potential losses in net farm income. TDR buyers, when questioned, indicated some knowledge of the distribution of net returns paid by the cooperative. This revealed their expectation concerning the mean and variance of the distribution. No direct elicitations of producer expectations were made, but a few growers expressed the opinion that, for their industry, this was a bell shaped curve but skewed to the right. That is, there is a long thin tail for high prices. The probability of receiving a high price is very low but not zero. Some non-risk-averse growers market to independent processors on the chance of achieving an occasional very large payoff. TDR buyers appeared most concerned about the lower end of this distribution, the impact of zero or negative net returns on their farm incomes due to their inability to sell the crop if they produced as independents.

The purchase of a TDR would indicate that producers are risk averse. Most buyers interviewed in this situation indicated that they considered the purchase of a TDR as a single cost of production to insure a home for their production. In a market for contingencies and insurance, it appeared that buyers were, in part, paying a one-time premium to obtain business

interruption insurance. Thus, the more risk-averse buyers were willing to pay a premium to avoid receiving the low end of the income distribution by guaranteeing a home for their production. The cooperative home would always pay a positive return, although pooling of commodity would prevent the producer from capturing the upper end of the crop income distribution.

The price paid for TDRs in this case can be hypothesized to vary depending on the risk averseness of the individual producers in the local procurement market. As previously stated, no direct elicitation of TDR buyers' utility functions were made; however, the survey data available indicated a wide range of utility functions were present in the population, and risk averse and risk neutral individuals seemed to dominate. This observation is supported by previous work in this area (e.g., Lin, Dean, and Moore 1978).

If there is a wide range of utility functions in the population, buyers with the steepest sloped utility functions would be willing to pay higher insurance premiums (the TDR price) to avoid a possible large loss in net farm income. For example, results of the survey indicated the maximum price paid for a TDR for a perishable perennial was 125 percent of a single year's gross sales value at an average yield. The average price paid for a TDR to the same cooperative was about 40 percent of one year's crop value. That a very risk averse individual will maximize utility by paying an insurance premium that exceeds the expected loss has been demonstrated by Anderson, Dillon, and Hardaker (1977). The actual price negotiated between a buyer and seller of TDRs in this market is the result of a seller offering to give up a TDR based on price discovery, having met a risk averse buyer whose willingness to pay is equal or greater than the offer price. Discussions with buyers indicated that actual bargaining over price occurred only about 10 percent of the time. Ninety percent of the buyers accepted the first price offered by the seller.

Case 4

Procurement Market:	Oligopsonistic
Product Market:	Oligopolistic
Cooperative Conduct:	Non-Competitive
Pool/Membership Policy:	Closed/Closed

This case is the opposite of case one. The cooperative has gained some oligopoly power in its product market. Again, this is similar to a large IOF food processor that has gained consumer allegiance to its national brand name(s) and/or has gained a large product market share. The procurement market is assumed to have relatively few IOF processors acting as price followers to the cooperative (i.e., marketing similar products to that of the cooperative) or to have a large number of IOF firms, each marketing undifferentiated products.

The closed pool/membership policy of the cooperative and the assumed market structure allow the cooperative to maximize oligopolistic profit. Cooperative members will receive above-competitive-market returns on their production. Non-cooperative members will market their production to the cooperative's IOF competitors under short-term contracts or in the spot market.

If the IOF competitors are price followers to the cooperative, few in number, and significant barriers to entry exist, they can attempt to act opportunistically if asset fixity is present. Non-cooperative members can expect to receive a competitive or less than competitive return for production in this situation, depending on the degree of asset fixity and the presence of opportunistic behavior. If a large number of IOF competitors, each marketing undifferentiated products, are active in the procurement market, producers selling to these firms can expect to receive the competitive market return associated with those undifferentiated markets.

The TDR value in the two situations described above can be either a premium return value or both a premium return value and an insurance value. If there is an atomistic IOF competitive fringe in the procurement market, the TDR value is the capitalized premium return value of the cooperative, and if there are relatively few IOFs, then there exists the potential for the TDR to reflect the capitalized value of both the premium return value and the insurance value of the cooperative. The transfer price for the TDRs in this case is resolved when a seller offering a TDR at the local market consensus price meets a buyer whose present value expectations of receiving a premium return from the cooperative, or both a premium return and a insurance value, are equal to or greater than the price of the TDR being offered.

The market structure and cooperative conduct situation where both premium return and "home for production" values are presented were not observed. It is likely that, if it were, non-cooperative producers would attempt through collective bargaining, government intervention, or by forming a new cooperative, to eliminate these opportunistic behavior or market access problems.

Summary and Conclusions

The major objective of this study was to evaluate the sources of value attributed to marketing cooperative delivery rights or contracts. Based on our limited data, the necessary conditions for TDRs to have value appear to be (1) potential buyers must have a positive prior probability that the TDR will improve their net farm income and wealth position, (2) there must be willing sellers, (3) TDR market transaction costs must be less than the value of the TDR, and (4) cooperatives must have closed pool and closed membership policies. Sufficient conditions would include (1) the presence of market failure due to barriers to entry, economies of scale or vertical integration providing the cooperative with a competitive advantage, and (2) the presence of a premium return value and/or an insurance value.

The supply of TDRs initially comes from a cooperative developing a delivery contract program with the expressed intent of giving existing members an asset that provides them the right to deliver to the cooperative marketing pool and share in the net revenues generated from that pool. The cooperative can gain three benefits by developing a TDR program: (1) it can generate equity from the initial offering of the TDRs, (2) it can gain continued equity contributions from cooperative members who are holders of TDRs, and (3) it can provide its members with a marketable asset that

reflects the current patronage value of the cooperative, which can exceed its stock value. The supply of TDRs in the secondary market comes from cooperative members who either want to reduce the amount of commodity being delivered to the cooperative or who want to exit the cooperative. The initial supply of TDRs can be increased through actions of the cooperative through either a desire to expand the marketing pool and/or acquire additional equity capital.

The demand for TDRs is a derived demand and is valued based on the right to deliver a particular quantity and quality of a commodity to the cooperative and to share in the net proceeds of the marketing pool. The demand reflects the expectation of producers that TDR ownership will, with some degree of certainty, increase net farm income and/or reduce the risk associated with potential losses in net farm income. The disutility assigned to the expectation is a function of the risk averseness of the individual producer. Most producers, in market situations where the cooperative generated net returns greater than the industry average, were able to translate their expectations into a TDR bid price. Risk averse producers of perishable crops were willing to pay a one-time premium to prevent net farm income loss due to perceived market coordination problems.

The market price of the TDR does not appear to reflect the appreciation in the value of cooperative tangible assets due to inflation. This is related to the non-profit nature of the cooperative, which passes through all of the net proceeds from its marketing operations. However, any change in cooperative assets that affects the mean or variance of the net proceeds will be capitalized in the TDR value.

The policy implications of the market for transferable delivery rights are significant. As indicated earlier, the conditions for a TDR to have value imply a less than ideal market structure. This brings into question whether or not cooperatives with TDR programs and their attendant provisions (e.g., closed pool and closed membership) should receive the same societal and legal considerations given to more competitive cooperatives that maintain open membership and open pool policies.

This study indicates that some producers operating under a cooperative form of business are capable of generating added utility and receiving the rewards. If cooperatives cannot pay returns to their members equal to that paid by IOFs, the cooperative will have failed to provide the "yardstick" measure to the industry. That is, it is possible, if cooperatives are prevented from closing membership or limiting and closing the size of their marketing pool, they may be placed at a competitive disadvantage to IOFs and will eventually be eliminated from the industry.

Further research needs lie in better measurement of risk and producers' attitudes toward risk and analysis of how cooperatives can mitigate risk for their members. Better knowledge of the variance and other moments about the mean of net returns in both single and multi-commodity pool cooperatives may lead to improved risk management strategies.

Notes

1. Throughout the paper we use the word "member" to indicate an individual producer who is currently delivering a commodity to the cooperative marketing pool.

2. Cotterill (1987) discusses cooperative valuation in the context of core versus global values. He discusses a core value as that which the cooperative would command if it were in a competitive equilibrium, while the global value is the amount cooperative members would be willing to pay rather than to do without the cooperative. A TDR would have a premium value if global value is in excess of core value.

3. Figure 1 is adopted from Halter and Dean 1971 and is based on the work originally done by Friedman and Savage (1974). We assume that such a function exists and can be specified for individual producers. There exist some empirical studies that provide examples of such utility functions for farm managers (e.g., Lin, Dean, and Moore 1974; Binswanger 1980; and King and Oamek 1983). It should be noted here that only under specific assumptions will the maximization of expected utility and the maximization of expected farm income lead to the same set of producer decisions.

4. This is a restatement of the Gordon Growth model, which is discussed in most intermediate finance texts (e.g., Copeland and Weston 1988). Although used to determine the value of IOF stock, it provides a rationale for determining the premium value of a TDR when there is a history of the cooperative providing a return to its members above that which would be paid by alternative firms in the same industry.

5. The California Tomato Growers Association estimates that 70 percent of IOF production contracts are on a tonnage basis.

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