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## Contracting in Agriculture: A Primer for Farm Leaders

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Research Report 2000-007  
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**Abstract:** *Contracting in agriculture has increased over the past several decades. This activity has heightened concerns about concentration, market power, and farmer welfare. The purpose of this paper is to describe some of the underlying motivations for contracting and to highlight some of the trade-offs made when making contracting decisions. These illustrations are intended to inform readers of the economic conditions for contracting, not provide empirical evidence of their implications, costs, or benefits.*

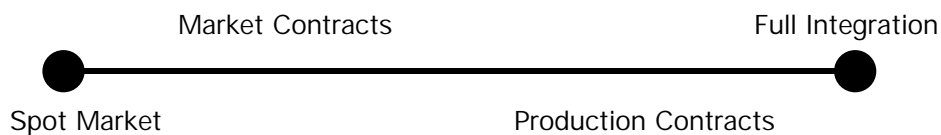
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# Contracting in Agriculture: A Primer for Farm Leaders

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The structure of agriculture is constantly changing. Factors such as changing technology, globalization, and government policy have all influenced the optimum size and organization of the agricultural sector. Understanding the driving forces behind these changes is essential both for assessing the impacts and having some perspective on what is likely to happen in the future.

Of particular importance to the farm sector is the relationship between farms and first handlers of the products produced on farms. These relationships fundamentally affect how farm products are produced and marketed. These relationships can be subdivided into different types of exchange mechanisms as shown below.



Most people are familiar with the spot market exchange mechanism in which the producer independently produces a product and then sells that product in the open market to the party willing to pay the highest price. Market contracts are essentially extensions of the spot market (Rehber) in that they specify only market characteristics such as price, quantity, and time of delivery (and sometimes quality), but do not directly specify production

practices. Production contracts, by contrast, specify production practices such as inputs to be used, cultural practices, etc. Thus, production contracts are a type of quasi-integration whereby the contractor gains some control over the production process of an upstream firm (farm) without having to take ownership of the firm (Blois; Monteverde and Teece). Finally, full integration occurs when the integrator actually takes ownership of the production process or controls almost all elements of production. There is, of course, a variety of each of these types of contracts, and each contract will be discussed in more detail later.

There has been a general increase in the use of contracting in agriculture over the past few decades. The figure below shows that the percentage of farms producing products under marketing and/or production contracts has increased from about 6% in 1969 to about 11% in 1993.

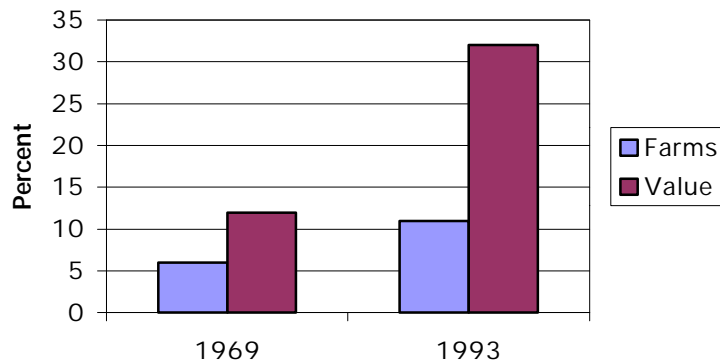


Figure 1. Percentages of Farms and Value of Products Produced Under Marketing and/or Production Contracts, 1969 and 1993.

Source: USDA, *Farm Costs and Returns Survey*, 1993

Moreover, the value of products produced under these contracts has increased from 12 to 32% (USDA, 1996).

The use of contracting, however, is not evenly distributed across products (Table 1).

**Table 1. Share of Products Produced Under Marketing and/or Production Contracts, 1993.**

Commodity	Share Produced Under Contract
Corn	12.3
Soybeans	12.4
Wheat	6.8
Cotton	32.7
Peanuts	64.6
Rice	19.6
Vegetables/Fruits/Nursery	47.4
Cattle/Hogs/Sheep	18.5
Dairy	47.9
Poultry	89.4
All Other Commodities	18.6
All Commodities	31.5

Source: USDA, *Farm Costs and Returns Survey*, 1993.

Thus, the share produced under contract is, on average, 31.5%, but ranges from a low of 6.8% for wheat to 89.4% for poultry. The range of the level of contracting across commodities raises questions as to why contracting behavior should be so different.

The objective of this paper is to outline some of the primary motivations for contracting in production agriculture and to discuss some of the potential tradeoffs that exist when producers make the decision to contract. Second, this paper will discuss the different types of contracts and identify some of the major implications of these contracts for agricultural producers.

## Motivations for Contracting

### Transaction Costs

A transaction occurs when a product moves between separable stages in the value chain—these can include both market transactions and intra-firm coordination. Transaction costs can be classified into three major categories—information, negotiation, and monitoring and enforcement costs (Hobbs, Kerr, and Klein). Information costs arise from identifying and assessing the reputation of possible trading partners, establishing a price, and becoming familiar with the quality standards. Negotiation costs are costs that arise from negotiating contracts, drawing up legal documents, and otherwise physically organizing a transaction. Following a transaction, monitoring and enforcement costs are associated with making sure the other party conforms to the agreed upon specifications.

Transaction costs play a role on both sides of a transaction—the seller and the buyer. For farmers, there is potentially a significant cost associated with monitoring markets for price movements, attending classes on marketing, searching for buyers for their products, etc. Other things equal, these added costs may induce the producer to contract or integrate in order to economize on those costs and allocate more time to production decisions. On the other side, processors can incur significant transaction costs in searching for suppliers and products of a given quality as well as monitoring markets for price changes.

Theory clearly shows that transaction costs are important to economic relationships and market structure (Coase; Williamson 1979) and there is empirical evidence to suggest that transaction costs have a significant impact on the structure of the food and fiber industry (Frank and Henderson). Thus, recognizing the role of transaction costs is important to understanding why farmers may choose to contract.

### **Asset Specificity<sup>1</sup>**

Asset specificity refers to the degree to which a particular asset is fixed in a particular mode of production. A classic example of asset specificity is that of a printing press. A printing press can be used to print a range of printed material, but printing is all for which it can be used. The owner of the printing press is not likely to offer his/her services on an open market because of the need to keep the press running to pay the amortized value (or loan) of the asset. Thus, the printer is more likely to seek out contracts to fulfill his/her printing requirements. The asset is not easily converted to other uses (as opposed to money), and thus forces the owner of the asset to seek contracts that will justify the ownership of the asset. If it were relatively easy to convert the printing press to other uses, the asset would not be "specific" and thus would not induce the contracting behavior.

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<sup>1</sup> It should be noted that asset specificity is a form of transaction cost. It is separated here because of its potential importance to some sectors of agriculture.

Asset specificity becomes an issue to the owner of the specific asset through a concept called the “hold-up” problem (Williamson 1989). In essence, the hold-up problem arises because there is a cost associated with converting the specific asset to another use. To avoid this cost, the owner of the specific asset will take a lower price for his/her output, up to the point where the lower price (times output) is equal to the cost of converting the specific asset to another use (also called a quasi-rent).

A more specific example may be a cotton harvester (picker). A cotton picker is an asset that has no real alternative use. To convert the cotton picker to another use would likely be expensive (at least in the sense that the picker would have to be sold and another asset purchased). To cover the cost of operation and ownership of the picker, the producer must produce a given amount of cotton. The producer may even be induced to take a lower price (return) on the cotton to insure that he has sufficient cash flow to pay back loans. As a result, the contractor has added bargaining power and can extract at least some profit from the producer because the producer has a greater degree of asset specificity.<sup>2</sup> Poultry houses and hog barns are also familiar examples of assets with almost no productive value in other uses.

### **Risk**

Risk appears to be a central issue in the discussion of contracting behavior and motivations (Blank and MacDonald; Rehber; Hueth and Ligon;

Miller; Knoeber and Thurman). Risk for the producer comes in various forms—yield, price, business, financial, etc. Yield risk is typically managed through cultural practices, but insurance products are also available to help manage the impacts of yield risk (for livestock producers, yield risk can be thought of as variations in average daily gain, feed efficiency, etc., which ultimately impact the amount of product to be sold). Yield risk makes up a substantial portion of the overall risk faced by a farmer, and as such has tended to dominate producer concerns.

Price risk, which results from the underlying variation or distribution of prices, is likely the most obvious source of risk in a market. Producing a product and selling it in the open market without price protection exposes the producer to substantial price risk, with only modest adverse movements in price resulting in substantial changes in net income. Thus, price risk is an important factor that producers must consider when making production and marketing decisions. This is especially true since the Federal Agricultural Improvement and Reform (FAIR) Act of 1996. FAIR eliminated many of the previous price guarantees, thereby exposing at least some producers to more potential price risk.

There are a variety of methods for managing price risk. First, is the use of futures and options contracts to forward price production. Forward pricing using futures is appealing because it offers the producer downside

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<sup>2</sup> This is, of course, a simplification of the problem but serves to illustrate the nature of asset



price protection. However, futures also have the unappealing feature that it “locks in” a price and does not allow the producer to capture favorable price movements. Options offer the producer the ability to capture favorable price movements while providing downside price protection, but options exhibit what is called “time decay” or the potential loss in value of an option as the time to maturity approaches. While futures and options offer an avenue through which producers can manage price risk, these instruments also introduce a new risk in the form of basis risk (difference between the futures price and the local cash price).

Contracting is another method of mitigating price risk. There are a variety of different types of contracts (discussed later), but the producer generally agrees to deliver his/her product to the buyer for a specified price. The price offered in a contract is typically lower than what might be observed in the market at any given point in time. The difference between the contract price and what could be obtained in the open market can be thought of as a “risk premium,” or an amount that the producer is willing to forgo in order to have a guaranteed buyer and a guaranteed price. The contract eliminates downside price risk, but also lowers upside potential.

Another source of risk is called “contract risk,” which is typically most relevant to production contracts. Once a contract is made and investments have been made to fulfill the contract, there is the risk that the contract will

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specificity and the hold-up problem.

not be renewed in the future. This is similar to the notion of asset specificity above in that contract risk results in a hold-up problem where the producer may be forced to take unfavorable terms to renew a contract in order to pay back investments made in production assets. The degree of contract risk depends, in part, on the size of the initial investment, the length of amortization on investments, and the length of contract. Thus, contract risk should be a consideration for producers deciding on contract alternatives.

### **Demand Assurance**

Demand assurance is related to risk in that uncertainty about buyers can induce one to seek out contractual relations to assure a buyer for ones product. This source of risk is especially important for new products or products with relatively small markets (blueberries as opposed to corn). On the other side of the transaction, buyers are interested in assuring that they have an ample, steady supply of product for their production processes. Thus, buyers may be interested in seeking out contractual relationships to assure the supply of product. Thus, assurance of supply and demand may motivate both producers and buyers to contract.

### **Access to Capital**

Access to capital is an important facilitator for agricultural production. Increasing input, equipment, and real estate costs have placed a larger burden on agricultural producers to secure sufficient capital to run a production operation. Forward pricing and contract production of products

may improve access to capital by assuring lenders of prices (loan repayment capacity) and buyers for products (Knight et al.). This increased access may come in the form of increased credit limits, or may result in better terms of credit. Thus, forward pricing may be used by producers in order to increase access to capital.

### **Autonomy**

Autonomy may be seen as a factor that decreases contracting involvement as opposed to increasing contracting (Gillespie and Eidman). Autonomy refers to the producer's ability to make decisions about production and/or marketing independently. For example, a producer that plants corn on his/her farm and then markets that corn in the cash market has complete autonomy because this producer has made the decision of what crop to plant, what inputs to use, when to harvest the crop, and when to market the crop. In contrast, broiler producers who are producing under contract likely have no choice about amount or type of inputs or when to market their chickens, and thus have almost no autonomy. Producers that value autonomy highly are less likely to enter into contractual relations, other things equal.

### **Contracting Trade-Offs**

It is important to realize, as with other economic decisions, that there are trade-offs in contracting. Consider the following example. In Figure 2, the peak of the plane in the upper left-hand corner can be visualized as a

situation where the producer has a low level of asset specificity, bears most of the risk, and has complete autonomy. An example might be a grain producer whose assets can be easily changed to produce corn, wheat, sorghum, soybeans, etc., thus having a low level of asset specificity.

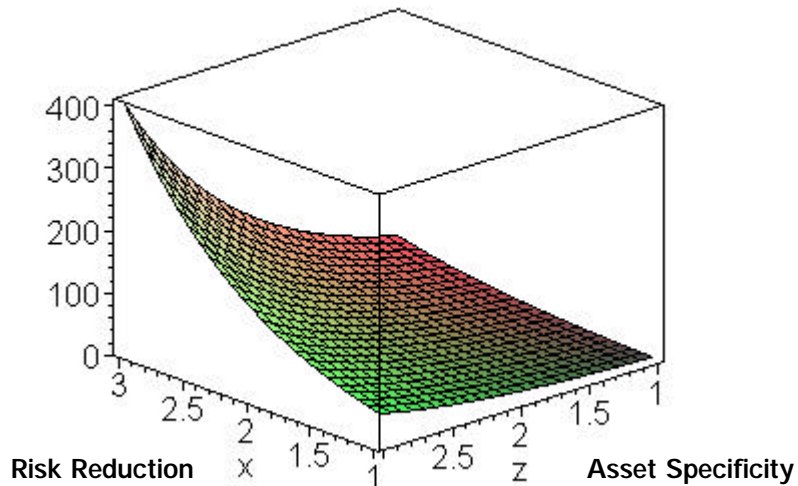


Figure 2. Illustration of Trade-Offs in Contracting Decisions.

The producer also sells his/her crops on the cash market (no forward contracting), and thus has a low level of risk reduction. Finally, because the producer is independent and not under contract, the producer has almost complete autonomy.

Now, to gain some level of risk reduction, the producer may choose to forward contract his/her crops. This action would help mitigate some of the price risk faced by the producer, but in so doing, the producer must also sacrifice some of his/her autonomy. That is, by forward contracting, the producer has taken away later options for marketing his/her crop.

Proceeding down the continuum for contracting, the producer may opt for a production contract, whereby not only marketing options are now limited, but production decisions are limited as well. This higher degree of risk reduction, however, means a much lower level of autonomy.

Likewise, at low levels of asset specificity, the producer has more options, and thus, more autonomy. Increasing the level of asset specificity necessarily implies that the producer has fewer options available to him/her, and thus has less autonomy.

The amount of autonomy reduction as a result of asset specificity or risk reduction depends on the nature of the contracts, products, and other factors. However, it is important to recognize that these trade-offs exist. Also, this is an example of only three of the potential motivating factors for contracting. Visualizing the trade-offs in higher dimensions is difficult, but those trade-offs must be considered as well.

## **Contract Types**

### **Market Contracts**

There are a variety of market contracts available to producers. Some of the major types of market contracts are: cash forward, basis, call, and minimum price contracts.

**Cash Forward Contracts** Cash forward contracts are the simplest form of market contract because it specifies a given price, quantity, and delivery location and time (and may also specify quality). By using a cash

forward contract, the producer is assured a price and a buyer. Cash forward contracts are often preferred over other contract types because they are simple, and do not include basis risk.<sup>3</sup> There is, however, potentially production risk if the contract is made prior to harvest. That is, the producer is uncertain of the exact amount of production prior to harvest, so there is the potential to contract for delivery of more product than is actually produced. The producer would, thus, have to purchase on the spot market to deliver on the contract. If yield loss was due to a widespread event (e.g., drought), spot prices may have increased above the contract price, resulting in a loss to the producer.

**Basis Contracts** Basis contracts are also commonly used contracts. In contrast to cash forward contracts, basis contracts specify a given basis level (a difference off the futures price) as the pricing mechanism as opposed to a given price. Basis contracts do provide some price protection and may increase a producer's autonomy because the producer has the option of when to price his/her crop. However, basis contracts still expose producers to some price level risk, and may expose producers to risk of changing spreads between different contract delivery months, depending on how the contract is constructed (Wisner and Kordick).

**Call Contracts** Call contracts operate similarly to basis contracts (in fact, a basis contract is a form of call contract if the producer has the option

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<sup>3</sup> In reality, basis risk is still present. However, the basis risk is absorbed by the buyer.

to fix the price/basis any time during the contract). However, call contracts may be either on the price level or basis. Thus, the producer has the autonomy to choose when to price his/her crop, but the producer is still exposed to some price/basis risk.

**Minimum Price Contracts** Minimum price contracts offer a minimum price at which the producer may sell his/her product to the buyer, but offers the producer the opportunity to capture favorable price movements if they occur (Waller et al.). The contractor calculates the minimum price bid by taking the cash forward contract price minus the premium for a call option and any interest between contract time and delivery. If the producer accepts the minimum price bid, the contractor will purchase the call option. If the price moves favorably for the producer (goes up), the call option will increase in value. The returns for the call option are then given to the producer, which increases his/her net price. If the price goes down, the option will expire worthless and the producer will receive the minimum price for his/her crop. The minimum price contract does offer significant downside price protection with the possibility to increase the net price above the minimum, but the producer must pay transaction costs, interest, and option premiums, and is exposed to some risk in the form of option price volatility.

There are a variety of hybrids of these major types and some types of market contracts have been omitted. In addition to market contracts, market pooling arrangements also serve as a type of market contract. In a market

pool, the producer agrees to deliver some or all of his/her crop to the pool in return for either a minimum price plus some division of the net returns of the pool, or just the net returns of the pool. In either case, the producer is attempting to capture some of the benefits or price advantages offered by pooled sales, which does tend to offer at least some level of price protection.

### **Production Contracts**

Production contracts can be divided into two major categories—resource providing contracts and production management contracts.

**Resource Providing Contracts** Resource providing contracts are relationships between growers and contractors which specify the use of some particular subset of inputs or resources in the production process. In return for the ability to have some control over the production process, the contractor agrees to provide certain resources for use. For example, a meat packing company may want to have hogs produced with particular genetic traits and having been fed a particular ration. In this case, the meat packing company would contract with a grower, providing the grower with feeder pigs of the contractors choice and the feed to be fed to those feeder pigs. To the producer, this contract has the advantage of reducing production costs because he/she no longer has to purchase the feeder pigs or feed. However, resource providing contracts typically do not specify price or returns to the producer so that the producer still bears most of the market risk.



**Production Management Contracts** Production management contracts, by comparison, are some combination of both marketing and resource providing contracts. These contracts typically stipulate production practices and prices or returns to growers. The advantage of this type of contract is that it shifts virtually all of the risk of production and marketing to the contractor, but removes virtually all of the autonomy from the grower. From the contractor's perspective, production management contracts offer a high degree of certainty about quality and availability of supply. Thus, depending on the preferences of both the grower and the contractor, production management contracts can be advantageous to both. The producer still faces "contract" risks and his investment is at risk, especially if the contract is shorter than the debt-amortization period for his assets.

### **Economic Implications of Contracting**

As with most economic phenomena, there are both positive and negative impacts of contracting, depending on the perspective one takes.

#### **Producer's Perspective**

From a producer's perspective, there are several real advantages of contracting. First, contracts of different types offer valuable risk management tools. That is, the continuum of different contract types offer varying degrees of risk reduction. Producers will choose those contracts that minimize their risk subject to other constraints such as desire for autonomy.

Second, contracts may simplify production and marketing decisions, thus improving the farm manager's effectiveness. While most contracts will require that producers forgo some price or income in exchange for this simplification, increased efficiency or reduced transaction costs may more than offset this forgone income.

Third, contracting will likely improve access to capital (either increased loan limits or improved terms of credit). For some producers, access to capital is a paramount concern (that is, no matter how autonomous one wants to be, if one cannot gain access to needed capital, autonomy is a moot concern). Finally, the demand assurance embodied within contracts is an appealing feature, especially for those growers producing products where markets are thin (not actively traded).

Contracting, however, does have disadvantages. First, contracting, to varying degrees, decreases autonomy or independent decision-making on the part of the producer. Market contracts reduce autonomy less than production contracts, but both contract types restrict independent decisions. Contracting may also increase "contract risk." That is, a grower may secure a contract to grow potatoes and subsequently invest in the equipment necessary to grow potatoes. By making that investment, the grower has exposed him/herself to the risk that the contract may not be renewed and thus be responsible for paying for assets that can no longer be used. This may force the grower to accept unfavorable terms for renewing the contract.

### **Contractor's Perspective**

It is important to note that the contractor is facing a similarly complex decision environment. The contractor must have a sufficient supply of product that is suitable in quality for his/her production process and must respond effectively to rapidly changing consumer demand, among other things. Thus, the contractor is seeking out opportunities to have some control over or certainty about the supply and quality of a product, which can be gained through contracting. To accomplish this, the contractor is willing to accept some level of risk (market/price and/or production) from the producer. In return, the contractor receives some assurance of supply and/or quality and likely purchases the product at less than what the market will bear without the contract (this difference in price is the risk premium producers are willing to forgo in order to have a guaranteed price).

### **Society's Perspective**

There is great debate about the social utility of contracting in agricultural markets. On the positive side, there is substantial evidence to suggest that contracting (vertical coordination) results in increased efficiency, which ultimately lowers consumer prices for food and fiber products (Azzam 1996; Azzam 1998; Kerkvliet). This argument suggests that contracting and other forms of integration/coordination decrease transaction costs and increase the efficiency of the economic actors and that

these efficiencies, through competition, are passed on to the consumer in the form of lower prices.

On the other hand, contracting may be a means through which firms increase market power. This can be divided into: price discrimination, competition in thin markets, preferential access to supplies and markets, extension of monopoly power, and “squeezing” of independent consumers/producers (Edwards). No consensus has yet been reached as to whether contracting and other forms of integration/coordination increase market power. However, two relevant questions arise. First, if market power is found to exist, what can be done about it? Second, does the potential efficiency gain discussed above outweigh the social welfare loss from the existence of market power? (Hennessy and Lawrence)

There are also other potential social costs. For example, areas of concentrated contract production may see a reduction in independent support business because contractors often do not source inputs locally, thus “exporting” net earnings out of the local area. This may lead to increased unemployment and decreased economic activity in the areas surrounding contract production. In addition, there are environmental concerns about the implications of concentrated animal production (which are often associated with contract production) on nutrient management and water and air quality.

## Conclusions

It is clear that the role of contracting in production contracting is increasing. Awareness of the potential motivations for contracting is essential for understanding the changes that are taking place. Most importantly, it is critical to understand the nature of the trade-offs that producers are facing so that correct conclusions can be drawn about the implications of contracting for producers. That is, before concluding that contracting is "bad" or has forced producers to accept lower prices, it is important to realize that producers may have made those contracting decisions for rational reasons and that the contracts are best suited to their desires and current economic conditions. Similarly, it is important to be aware of potential differences in bargaining power, which arise as a result of asset specificity. Like most economic relationships, there is no clear answer to what is "right" or "wrong."

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