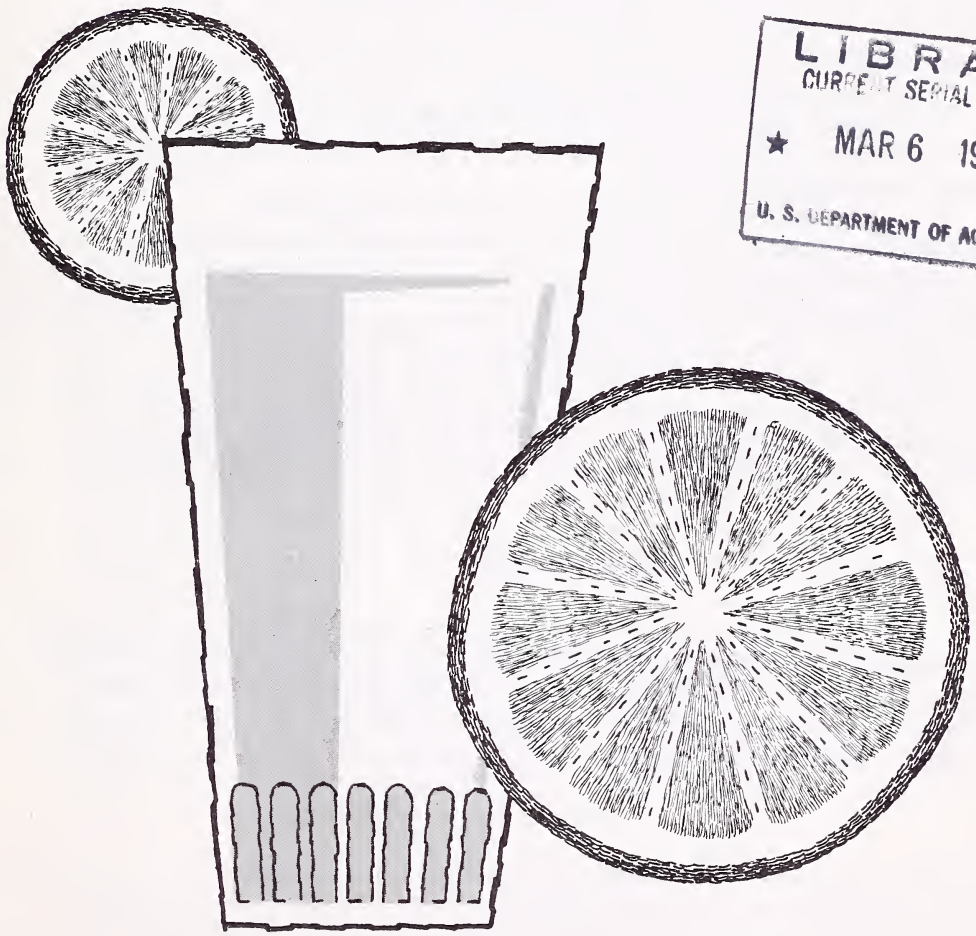
# Possibilities for Futures Trading in Florida Citrus Fruit and Products





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## SUMMARY AND CONCLUSIONS

Representatives of the Florida citrus industry have expressed interest in the feasibility of organized futures trading in frozen orange concentrate or oranges. This study attempts to evaluate the possibilities for futures trading in these commodities.

Futures trading is not an independent activity, but is interrelated with the whole marketing system. Whether or not organized futures would be useful or even feasible for a specific commodity depends largely upon the characteristics of the commodity and the structure of the market. Consequently, an appraisal of the possibilities for such trading in frozen orange concentrate or oranges requires an examination of the characteristics of these commodities and their markets, including such factors as integration of ownership and of production, manufacturing, storage, and distribution functions, product differentiation, market information, standardization of trading practices, and methods of financing.

Such an examination of the marketing system for frozen orange concentrate and oranges indicates that possibilities of futures trading in these commodities are unfavorable at present. This conclusion is based on the following characteristics of the markets for these products:

1. To a substantial degree, the various phases of production and marketing of frozen orange concentrate and oranges are vertically integrated; that is, two or more phases of production or marketing are controlled by the same firm. Consequently, the numbers of buyers and sellers tend to be low, and the volume of trading in these commodities that takes place under open or free market conditions is relatively small.

2. Orange concentrate is, for the most part, produced and marketed under brand names and considerable significance is assigned the brand name in the buying and selling of the product at all levels of trade. Because of the importance of brands in this respect, it appears impossible, under present conditions, to establish a futures contract that is in line with trade interests.

3. Market information on orange concentrate and oranges is not very widely distributed. The limited distribution reflects the absence of a demand for such information by individuals outside the citrus industry who might be interested in futures trading. This is a condition that is to be expected, since it is difficult for these individuals to make use of such information in an integrated industry.

4. There is a high degree of concentration of control in the citrus market.

5. The nature of futures trading is such that its use as an aid to financing would necessitate a greater division and redistribution of the ownership responsibility in the manufacturing and marketing of orange concentrate and oranges. The development of the citrus market has been in the direction of increased concentration of ownership at the manufacturing, storage, and distribution levels, including retailing in a few instances. Among other effects, this consolidation of ownership enables price risks to be spread over a large number of items, none of which may follow the same price pattern. This development has increased capital requirements of the firms operating in this industry. In the case of financing through futures trading, part of the gains or losses that otherwise would be received by the integrated firm go to participants in the futures market. Thus, the advantages expected from integration of successive phases of the production and marketing process are best achieved through financing by some other means, such as the sale of securities. Futures trading moderates the effect of integration, since participants in the futures markets become claimants to the yield realized from certain phases of the process.

Finally, it should be kept in mind that these conclusions are based upon characteristics of the citrus market as of 1954-55. The findings do not, therefore, rule out the possibility that the Florida citrus market may later be more favorable to the development of futures trading.

# POSSIBILITIES FOR FUTURES TRADING IN FLORIDA CITRUS FRUIT AND PRODUCTS

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## INTRODUCTION

The primary objectives of this study are to determine the possibilities for the development of organized futures trading in Florida citrus fruit or citrus products, and to indicate the impact that such trading might have on producers, processors, and others handling citrus products.

Industry representatives have been primarily concerned with the feasibility of futures trading in frozen orange concentrate. They also have expressed interest, but to a more limited extent, in futures trading for fresh oranges. Accordingly, this study considers the possibilities for organized futures trading in both of the commodities, but with primary emphasis on frozen orange concentrate.

In conducting this study, information was obtained directly from citrus processing firms and related marketing and business organizations, and from reports on other studies concerning: (1) The methods of buying and selling citrus at the various levels of trade, (2) the type and nature of firms in the industry, (3) the sources and arrangements for obtaining working capital, and (4) the technical and economic problems involved in establishing workable futures contracts.

## METHOD OF APPROACH 1/

An appraisal of possibilities for development of futures trading in frozen orange concentrate (henceforth referred to as orange concentrate) and oranges involves an examination of these commodities and their market organization from the standpoint of the presence or absence of characteristics favorable to futures trading. Characteristics favorable to the development of futures trading in a commodity, and hence the factors considered here, are:

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1/ This approach reflects a point of view toward futures trading and its economic implications developed by the author and others while working on a study of futures trading at the Brookings Institution. The Brookings study was partially financed by the U. S. Department of Agriculture.

1. The organization pattern of the industry must be such that the responsibility for the various phases of production and marketing are, to a substantial degree, divided among different groups of specialized and fairly numerous firms, rather than among a few large integrated firms.

2. The commodity must be purchased and sold on the basis of quality standards that convey a common meaning to all buyers and sellers.

3. Market information concerning supply, demand, and price for the commodity must be widely distributed and usable by a large number of potential buyers and sellers.

4. The methods of buying and selling the commodity in the cash trade must be standardized to the point where the further standardization necessary in establishing a futures contract is consistent with trade interest.

5. There should exist a potential trade interest in the type of financing afforded by futures trading.

All of these characteristics are present in varying degrees in all commodity markets; consequently, they do not provide absolute standards from which to conclude that commodity "A" is completely favorable to futures trading, whereas commodity "B" is completely unfavorable. However, they are useful for indicating the relative degree to which a commodity market is favorable or unfavorable. The only definitive way, of course, to determine the possibilities for futures trading in citrus products would be to provide a futures contract and observe the results.

The following section on the organization pattern of the citrus industry deals primarily with the first criterion listed, namely, number and integration of firms. Thereafter, criteria relating to marketing practices concerning product differentiation, market information, standardization of trading practices, and methods of financing are discussed.

## ORGANIZATION PATTERN OF THE CITRUS INDUSTRY

The marketing system for commodities differs with respect to patterns of organization and structures. Some commodities are produced and sold by a large number of firms, each accounting for a small proportion of total sales. Other commodities, such as orange concentrate, are produced by only a few firms, some of which are large. Frequently the number and size of firms is closely related to the extent to which firms in an industry are vertically integrated; that is, the extent to which their operations are specialized or diversified. At one extreme, the responsibility for the various phases of production and marketing, such as growing, assembling, mixing, transporting, storing, merchandising, and processing the commodity, may be divided among different groups of specialty firms. For example, some firms may specialize in growing the commodity, others in merchandising, others in processing. This

organization pattern is made possible by the exchange system; that is, by purchase and sale among these specialty firms. The greater the divisibility of production and marketing among specialty firms, the greater is the number of trade levels and number of firms, and hence the breadth of the market. In brief, the market has many buyers and sellers and extensive and active trading. Illustrative of this is the grain market, which includes specialty groups such as growers, grain elevator operators, merchants (domestic and export), and flour millers, to mention the principal types.

At the other extreme, there is the vertically integrated pattern. 2/ In this type, the responsibility for the various phases of production and marketing is undertaken by a few integrated firms rather than by specialty groups. The existence of vertical integration means that the number of specialty group firms is small, and also that the number of trade levels, the number of buyers and sellers, and hence the breadth of trade in the commodity concerned are limited. Likewise, price risks faced by such firms may be moderated because of the diversity of products handled and levels of trade at which operations are conducted.

Of these two types of organization patterns, the nonintegrated one is favorable to the development of futures trading, whereas the integrated one is unfavorable. The citrus industry is to a substantial degree organized along the vertically integrated pattern and is, therefore, unfavorable to the development of futures trading. The specific reasons why the vertically integrated organization pattern is unfavorable to futures trading and the evidence of its existence in the Florida citrus industry are developed in following sections of this report.

## Vertical Integration in Relation to Convertibility Requirements for Futures Trading

Through the convertibility of commodity futures contracts into either commodities or money, all values tend to represent economic equivalents, irrespective of whether settlements of commodity futures contracts are made by offset or delivery of commodities. However, the realization of this result is possible in practice only to the extent that supplies of the commodity, since they serve as the unit of account for the settlement of contracts, are continuously available to any and all traders substantially on the basis of price.

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2/ "Vertical integration," as used in this study, means the combining of two or more successive phases of the process of production or marketing so that the same firm retains either complete or partial ownership of the commodity during these phases. In complete integration of two successive phases of production or marketing of a commodity, there is no open-market transfer of commodity ownership between the two levels. Partial integration generally is achieved through various kinds of contractual arrangements that give the holders certain ownership or control rights to the commodity during the two or more successive phases. As a consequence, exchange does not take place on an open-market basis.

In other words, the supplies of the commodity traded on futures contracts must be traded under the conditions of a "free market." 3/ For in such markets the ownership of commodities is transferred among buyers and sellers substantially on the basis of price. This means that anyone who buys commodity futures need not be unduly concerned over the possibility that he will incur a loss because of having to take delivery of commodities, for he can resell them at the market price. Likewise, a seller of futures need not be unduly concerned over the possibility of incurring a loss because of inability to obtain supplies for delivery, since, given a free market, he can obtain supplies by offering the going market price. 4/

Thus, free market conditions are essential to the development of futures trading. 5/ It is in this respect that vertical integration emerges as an important limitation on the development of futures trading. Specifically, the encumbering of ownership of the commodity creates conditions which deviate from those of a free market. The nature of this deviation, as was noted earlier, may involve the complete elimination of transfers of commodity ownership at a potential level of trade, as in the case when the same firm retains full ownership of commodities at two successive stages in the production and marketing

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3/ The phrase "free market" is used in this study to characterize a situation in which the transfer of commodity ownership among buyers and sellers is done substantially on the basis of price. In other words, exchange among traders is of the "no-strings-attached" type. Illustrative of this is a situation where the decision of a particular grower to sell his commodity to a particular buyer and, likewise, the decision of the buyer to purchase from the grower in both cases is free from the influences of prior obligations of either party to the other. In reality, the transfer of commodity ownership does not always take place purely on this basis. Such things as friendship among traders and long business associations do exert influence apart from price. "Free supply" is used to mean that supply the ownership of which is transferred among buyers and sellers primarily on the basis of price.

4/ It should be noted that free market conditions are equally as important to traders who settle their contracts by offset.

5/ It is not possible to specify precisely what the magnitude of free market supplies should be in order to have futures trading. The willingness of individuals to participate in futures trading is, for the most part, dependent upon the assurance that their outcomes will be a product of competitive market influences. Other things the same, the chances of such realizations and, hence, the extent of futures trading participation vary directly with the quantity of supplies traded under free market conditions. The matter of free supplies is crucial to all futures transactions irrespective of whether final settlements are made by offset or delivery. This point is not always recognized because in practice futures contracts are, for the most part, settled by offset rather than delivery, thereby making it appear that free supplies are only important to those who settle by delivery.

process. 6/ On the other hand, it may involve almost the equivalent of eliminating such ownership transfers through the imposition of so many exchange requirements that only a limited number of firms can acquire or dispose of supplies on those terms.

The means through which partial integration is realized are referred to as nonprice techniques or considerations. The net effect of nonprice techniques is to limit the transfer of commodity ownership to those firms which are in a position to compete for available supplies on the basis of price plus some form of nonprice techniques. Illustrative of competition that involves price plus nonprice techniques is a situation where a buyer extends production loans to a grower on condition that the grower will sell his crop to the buyer at the market price at harvest time. The nonprice technique here is the production financing. By its use, the buyer acquires ownership rights to the grower's crop at or near the time of harvest and, thus, reduces the supplies available to those who can compete only on the basis of price and the supplies available for the support of futures trading. 7/

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6/ A clearer notion of why a vertically integrated market sector is unfavorable to the development of futures trading can be gained perhaps from a few observations with respect to why a nonintegrated sector is favorable. A nonintegrated market sector is one in which the total responsibility for production and exchange activity involved between growers and consumers is divided up among many groups of specialty firms. For example, some firms specialize in production at the farm level, others in such things as storage, merchandising, processing, and transportation. This division of responsibility among firms is characterized and is made possible by exchange of commodities and ownership claims among the groups of specialty firms. The nature of exchange among them may involve the transfer of outright ownership of the commodity or the transfer of rights of possession or control that are necessary in order to perform some type of service. Thus, the division of responsibility among groups of specialty firms is accompanied by greater exchange activity in the market sector. Given this diversity of interest among firms and the greater numbers that are possible because of their ability to specialize in limited areas of activity, it goes almost without saying that there is likely to be a strong interest in futures trading. The grain market is illustrative of such a diversity of interest. It includes growers, elevator operators, merchants, processors -- a diversified interest that provides the basis for the widespread use of futures trading by the grain trade.

7/ Where the type of arrangement described is employed in practice, the buyer generally agrees to pay the market price or that of his competitors at the time the grower is ready to sell. In the absence of knowledge of the financing arrangements between the buyer and grower, exchange between them appears to be solely in response to price. In fact, however, exchange is responsive to both price and production financing. This type of arrangement enables the buyer to acquire first priority of purchase and, hence, reduce his uncertainty of obtaining his supply. Likewise, the grower is enabled to obtain production financing and more certainty with respect to the sale of his crop.

The foregoing discussion has dealt with the effects of vertical integration on the nature of exchange, the availability of supply, and the development of futures trading. The extent of vertical integration in the orange and orange concentrate markets will now be examined.

## Orange Market

After the development of orange concentrate during the mid-1940's, the utilization of the Florida orange crop changed so that processing became the major outlet. Florida growers sold 49,500,000 boxes of oranges from the 1945-46 crop --the year just prior to the first one in which orange concentrate was sold commercially. Of this amount, roughly 60 percent was sold to fresh market outlets and 40 percent was processed into single-strength juices and blends. In contrast, they sold 90,750,000 boxes from the 1953-54 crop, of which roughly 70 percent was processed and 30 percent sold fresh. Of the 62,904,000 boxes of oranges processed from the 1953-54 crop, 48,602,000 boxes or approximately 77 percent went into the manufacture of orange concentrate and the remainder into the manufacture of single-strength juices, blends, etc.

The manufacture of orange concentrate and other orange products in Florida is in the hands of about 37 processing firms. However, all the orange concentrate and an estimated 85 percent of the single-strength orange juices and blends are made by 19 of these firms. Information used in this study concerning processing activities was obtained largely from this latter group of firms.

Of the Florida orange supply at the grower level, more than 50 percent is influenced by some degree of vertical integration. Sale of oranges at the grower level involves both price and nonprice considerations. Buyers compete for and acquire the major part of the crop on the basis of price plus offers to growers of certain other inducements. Competition for oranges on this basis is most pronounced among processing firms. Apparently these firms have not been able to obtain the desired quantity of oranges by simply going into the market and bidding for supplies on the basis of price alone.

Consequently, they employ various means for reducing their uncertainty over supply. Such means include (1) the form of business organization, (2) processor-grower financial tieups, and (3) outright ownership of orange groves.

All three of the techniques mentioned have in common the fact that they enable the processing firm to acquire orange supplies at the grower level, thus reducing the quantity of free market supplies.

Form of business organization.--Of the 19 firms which process most of the Florida orange crop, 7 are grower-owned or cooperative forms of business, and the remainder are organized as either partnerships or corporations, or as some variant of the two.

Strictly on the basis of form of business organization, the most effective of these, from the standpoint of obtaining oranges for processing without

bidding for them in the open market, is the cooperative processing firm. As they are organized in Florida, individual member growers of oranges are under contract to deliver their fruit to the cooperative.

Generally, the grower member does not receive full payment for the fruit delivered to the cooperative until after it is sold in either fresh or processed form. The management of the cooperative handles payment to growers through various kinds of pooling arrangements in which the return to growers is calculated on the basis of their share in the proceeds from the sales of a fresh fruit pool or processing pool, less, of course, certain expenses incurred by the association. The cooperative exercises control over the fruit of its members.

Thus, the cooperative processing firm competes for and obtains a share of the orange crop not simply on the basis of price, but rather on the basis of price plus such things as the importance that growers attach to membership, plus the opportunities it provides growers to invest in the manufacture and distribution of oranges in processed form.

In this study, it was not possible to obtain actual figures on the supply of oranges controlled at the grower level by cooperatives. Information obtained by interview with personnel of the seven cooperative processing firms and from other people well informed on the Florida citrus industry suggests that this would amount to at least 25 percent of the Florida crop. 8/

Somewhat akin to the cooperative principle as a technique for competing for oranges at the grower level are the so-called "grower participation plans" between growers and firms that are not cooperatives. Under the grower participation plan, the processor and grower enter a contract whereby the processor agrees to pay the grower a certain percent of the market price for oranges on delivery. The initial payment to the grower is generally 80 to 85 percent of the market price. The additional 15 to 20 percent due the grower is paid after sale of the finished product. Under this arrangement, the grower shares in the profits from sales of the fruit in processed form. This assumes that the price of the finished product is sufficient to cover the additional amount due growers. In exchange for this, the grower agrees to deliver his oranges to the processor.

These participation plans effectively shift to the processor control over the disposition of the oranges. The supply of oranges available under the conditions of a free market or on the basis of price alone is reduced by that amount. Through the participation plan, the processing firm competes for oranges at the grower level on the basis of price plus the advantages that the grower expects from receiving the large initial cash payment and the opportunity to invest in the manufacturing and distribution stages through the

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8/ It should be noted that not all cooperative processing firms obtain all of their orange supply from member growers. Some do, whereas others may purchase from nonmembers. The bulk of their supply, however, is obtained from grower members.

profit-sharing arrangement. From the processor's standpoint, the use of the participation plan to obtain control over oranges at the grower level clearly requires large amounts of capital, if it is used on a substantial scale. Approximately 6 percent of the 1953-54 crop was obtained through participation plans.

Processor-grower financial tieups.--Another technique through which processing firms and other buyers achieve control over the disposition of oranges at the grower level is that of extending loans to growers in exchange for the grower's promise, either tacit or explicit, to give the processor the first option to buy his crop at harvest. This practice was found to be common with most of the processing firms. Growers obtain such loans for different purposes; for example, to cover costs of picking and hauling. For 1953-54, the percent of fruit purchases covered by financial advances of one type or another by the firms concerned ranged from 10 percent for some to 75 percent for others.

As with the other techniques discussed, loans to growers that enable the buyer to acquire a first option to purchase oranges reduce the quantity of oranges available on the free market. The disposition of supply from the grower level forward is responsive to market price plus the advantages that the grower expects from obtaining funds currently to use in his citrus operations. Leaving out the cooperative processing firms and participation plans, it appears that 15 to 20 percent of the Florida crop is covered by financial advances.

Ownership of orange groves by processors.--Finally, some of the processing firms obtain part of their supply of oranges from their own or leased groves. That supply, of course, is not available on the free market. Based on information obtained from processing firms, some 6 million boxes of oranges were obtained by processors during the 1953-54 season from their own groves. This represents about 6 percent of the total Florida orange crop for that year and about 9 percent of the total quantity processed.

The actual quantity of oranges committed to processing firms and others under the foregoing types of contractual or financial arrangements is not known precisely. On the basis of the information obtained, it appears that roughly 50 to 60 percent of the crop is involved. The quantity of oranges left on an open-market basis does not appear to afford a supply base broad enough for futures trading.

The tendency for processing firms to integrate back to grower level in the manner described is something that might reasonably be expected in light of certain problems that characterize the manufacture of orange concentrate. The product is manufactured in accordance with specified standards of quality. For example, orange concentrate must satisfy specified standards as to color and acid-sugar content. In contrast with these exacting requirements for the finished product, the oranges used by processors vary both as to color and acid-sugar content. Such differences are largely accounted for by variation in the quality of juice for concentrating purposes among the several varieties used and in quality at different periods of harvest, or some combination of the two. For example, the juice extracted from oranges harvested during the first part of the season is generally lighter in color than that of oranges harvested later in the season.

In this situation, the decision as to when oranges should be harvested for use in making orange concentrate, the scheduling of supplies to processing plants, and other decisions of this character must largely be those of the processor. This is essential, since it is he who has to combine the juices of different varieties, or juices of the same variety at different periods of harvest, so as to manufacture a standard product. To acquire the right to make decisions of this type, processors must acquire certain rights over part of the orange supplies at the grower level. Therefore, the integration of growing and processing in the citrus industry appears to be a logical development.

## Orange Concentrate Market

Orange concentrate does not become salable until it is packed in lithographed cans. In the lithographing process, the brand name is imprinted on or into the can itself, as contrasted with the practice in canning many fruits and vegetables in which the brand name is carried on paper labels that can be attached after the cans are filled and closed. Because it is necessary to make lithographed cans for most of the pack, the brand of orange concentrate and the size of container used are determined by the processor at the time of manufacture of the cans. Thus, orange concentrate first appears in salable form as a branded product and retains that identity from the time of manufacture through its final distribution at retail.

It should be noted that the first sale, if a sale occurs, is to the firm whose brand name appears on the finished product. Once the firm acquires supplies of its brand -- usually by contract with a processor, if it does not own processing facilities -- nearly all further production and exchange of orange concentrate through to its final distribution at retail is under the direct control of that firm, the owner of the brand name. The integrating of these successive phases of production and selling activities to the consumer level by the firm that owns the brand name rules out any further trade in orange concentrate except at or near the retail level.

In addition to assuming the major share of the responsibility for production and selling of orange concentrate beyond the point of manufacture, the operations of the owner-seller of a brand of orange concentrate may include the actual manufacture of the concentrate. Available information indicates that 50 percent or more of the total Florida production of orange concentrate is produced and sold by firms of this type.

The owner-seller of a brand of orange concentrate who does not own processing facilities usually obtains supplies by contracting directly with processing firms. Most of the Florida processing firms do some of this type of business; that is, they custom-pack orange concentrate under the brand name and quality specifications of other firms (the latter firms henceforth are referred to as custom buyers). The terms of the arrangements between processors and custom buyers vary as to detail. However, all such arrangements make the production of orange concentrate somewhat of a joint undertaking between the processor and custom buyer. From the standpoint of the custom buyer, his production responsibility with respect to his own brand of orange concentrate includes or begins with its manufacture.

The degree of this relationship is revealed by the nature of the processor-customer contracts currently used. In one type of arrangement, an owner-seller obtains the major part, if not all; of his supply by paying Florida processors a certain price per dozen cans processed. Under this arrangement, the custom buyer finances the cost of all major ingredients such as fruit, cans and containers, and storage; whereas, the actual procurement of fruit and cans, arranging for storage, and other functions are handled by the processor.

Another arrangement and perhaps the more prevalent type is one in which the custom buyer (usually at the beginning of a new processing season) places an order with a processor to pack his season's requirements of orange concentrate. On the basis of this arrangement, orders are placed with can manufacturers for a corresponding number of lithographed cans, the cost of which is borne either then or subsequently by the custom buyer, since the tinplate is prepared solely for his brand.

If the order of the custom buyer is so small that the processor can give immediate shipment, say within a week, the price to the custom buyer is generally that which processors refer to as the market price for the current week. 9/ Conversely, if the order is so large that shipments will need to be spread out over the season or if, for some other reason, either party prefers this arrangement, the price to the custom buyer is the current price at the time of each shipment. 10/

That quantity of the customer's brand that accumulates in advance of the time agreed upon for shipment is generally stored in the processor's warehouse. However, the gains or losses from the transfer of such stocks, in view of the pricing arrangement, are shared jointly, but not necessarily equally, by the processor and custom buyer. Any returns from storage up to the time at which full ownership and physical possession are taken over by the custom buyer are reflected in the price at which the transfer takes place. Since this price is not fixed for either party until the actual date of shipment, both parties are open on price and, hence, on the returns from storage over the interval.

Most of the processor-custom buyer contracts employed in Florida are a close variant of that just described. The nature of these arrangements, along with the personalized character of supply that is inherent in the use of lithographed cans, makes the production of orange concentrate a joint responsibility between processors and custom buyers. Through these arrangements, the ownership responsibility of the custom buyer begins the moment that he or the

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9/ The current week's price for a given processor is generally in line with the prices at which other processors are selling during the same week.

10/ Such a price arrangement could work to the disadvantage of either party if it were possible for either to change the rate of shipment when the level of price was in his favor. In order to avoid this, provisions are made that a customer buyer is not able to obtain shipments at a higher rate than agreed upon when prices are considered low and, likewise, the processor is not permitted to increase the rate of shipments at a time when prices are considered high.

processor places an order with the can manufacturer for a quantity of cans carrying his brand label. With the exception of subsequent transfer of full ownership and physical possession to the custom buyer, there frequently are no further ownership transfers involved except at or near the retail level. This is especially true in the case of chainstores, some of which obtain supplies of their own brands by contracting directly with processors.

The characteristics of the orange concentrate trade indicate that a major share of the responsibility for the various processes of production and sale, up to the consumer level, is assumed by processing firms or by owner-sellers of a particular brand. As a consequence, the possibility for ownership transfers is so limited that there are no discernible points or levels of trade at which there is an open and active market. Trade at all points tends to take place on a rather formal and personally negotiated basis. On the other hand, the development of futures trading is contingent upon the existence of a level of trade characterized by extensive buying and selling activity of the open or free market type. 11/ Therefore, present conditions in the orange concentrate market are inconsistent with the development of futures trading.

## Vertical Integration as It Relates to Market Structure

From the preceding discussion, it can be seen that a vertically integrated market tends to have the following characteristics:

1. The number of firms who can buy or sell the commodity at each of the potential levels of trade tends to be limited to those firms which can compete on the basis of price plus nonprice considerations; consequently, many firms that otherwise might be active traders in the cash commodity and, hence, potential traders in futures contracts, are likely to be excluded.

2. Production and exchange activities thus will tend to be concentrated in the hands of a few firms of increasing size. This expansion in size requires, among other things, the mobilization of large amounts of capital and, for this reason also, the number of firms can be expected to be small.

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11/ Since there is frequently more than one level of trade in the marketing of agricultural commodities, the establishment of futures trading may involve some consideration of the most appropriate level to select. Such a selection is dictated largely by the necessity to have futures trading at a point that permits buyers and sellers the greatest amount of flexibility and maneuverability. This condition tends to be more nearly satisfied at the early levels of trade and least satisfied at the retail level. For example, futures trading is common in wheat, but not in flour; in cotton, but not in cloth. In the case of orange concentrate, the logical choice for futures trading is at the processor level.

Insofar as futures trading is concerned, the concentration of control in the hands of a few firms is a factor that acts to limit participation, since potential buyers and sellers of commodity futures must reckon with the fact that large firms in the market could influence the outcomes of their transactions in futures. For the most part, individuals are not attracted to futures trading under such conditions. The Florida orange market includes a relatively large number of buyers and sellers if growers, intermediary handlers, fresh fruit dealers, and processing firms are included. However, the major share of the responsibilities for the processes of production and exchange is assumed by a relatively small number of processing firms.

The importance of processing firms in the citrus industry can be more fully appreciated in the light of certain rather important adjustments that occurred after the development of orange concentrate during the midforties. Important among these was a reduction in the number of principal firms and increased market concentration. Highlights of these developments and of their significance to vertical integration, and, hence, to futures trading, follow.

The development of frozen orange concentrate during the 1940's provided Florida growers with an additional sales outlet. Until that time, their outlets were confined largely to sales of oranges in fresh form and sales to processors of single-strength orange juice. The addition of concentrate as an outlet could logically be expected to provide growers with a much broader market in terms of numbers of buyers and sellers. 12/ This would have been the case if the manufacture of orange concentrate had been accompanied by an increase in the number of processing firms. Actually, however, the increased manufacture of orange concentrate was accompanied by a decline in the number of firms processing oranges. The decline took place primarily among the firms processing single-strength orange juice. For example, in 1947 there were about 65 plants in Florida processing single-strength orange juice and blends, whereas in 1953 there were less than 35 such plants. 13/ This decline in number of plants came mostly as a result of firms going out of business and mergers of existing firms.

Insofar as the orange concentrate industry is concerned, the degree of concentration of control among firms is greater than might be inferred from the number of firms. During the 1953-54 season, the processing facilities of 5 of the 19 firms were used entirely for the production of orange concentrate under brand labels of the other 14 processing firms. Firms in the latter group acquired the orange concentrate produced by these 5 firms, an estimated 10 percent of the total Florida production, either by leasing processing facilities from them or by contracting for the output of one or more of the 5 firms at a

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12/ The fact that growers did not achieve a broader market in terms of number of buyers is in no way intended to suggest that this worked to the disadvantage of growers. All evidence in this respect suggests that the reverse is true because of the increased demand for oranges that accompanied the development of orange concentrate.

13/ Wall Street Journal, December 21, 1953.

stipulated price. In most cases, the processing firms that acquired the production of the 5 firms, whether through leasing or by contract, assumed the responsibility for financing all production and distribution of the orange concentrate except that involved in processing. In addition to these 5 firms, there were other processors who contracted part of their production directly to other processors. For the most part, large firms leased or contracted for the output of smaller firms.

The degree of market concentration present in the Florida orange market can be further shown by looking at the distribution of total production among processing firms. The bulk of the ownership and control of orange concentrate is held by a small number of firms. Of the 65 million gallons of orange concentrate produced in Florida during 1953-54, about 50 percent was produced by 3 firms, and 70 percent was accounted for by 7 firms.

## MARKETING PRACTICES

As was explained in the section on Method of Approach, the possibilities of developing futures trading in a particular commodity depend in part on the organization pattern of the industry involved and in part on the marketing practices which the industry employs. In this section, the principal practices characterizing the production and sale of frozen orange concentrate will be examined.

### Product Differentiation

Among the factors unfavorable to the development of futures trading are differences among products. This factor exists when the product of any one firm is not a "close" substitute, in the minds of buyers, for that of any other firm. Orange concentrate is an example of a differentiated product. It is produced and sold by several processing firms, but the product of each firm is somewhat different, insofar as the market is concerned. For example, Minute Maid, Snow Crop, Donald Duck, Ace High, and a number of chainstore brands are, to a certain extent, substitutable for one another. However, they differ enough that buyers reflect a definite preference for one brand over another. Such preferences exist between brands selling at the same price as well as between those selling at different prices. Price differentials are as much as 4 cents per 6-ounce can at the retail level. 14/

The terms of commodity futures contracts must be quite similar to those customarily used by the trade in buying and selling the commodity. Orange concentrate is traded under brand names and, hence, primary consideration would need to be given to the feasibility of an orange futures contract that

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14/ The distinction between advertised and nonadvertised brands is somewhat misleading. All brands are advertised in the sense that they carry a brand label, and all firms do a certain amount of advertising. The distinction rests on differences in the extent of advertising.

permitted delivery of specific brands. The fact that a commodity is packaged under brand names does not, of itself, make it unfeasible to establish a futures contract, with deliveries under the brand names. However, this is not the case if the commodity is exchanged under conditions where brand names are considered by the trade as partly indicative of quality.

A problem exists in these circumstances because, on the one hand, a futures contract that permits delivery of different brands must be established so as to allow appropriate premiums and discounts for delivery of brands of different qualities. On the other hand, the working out of a premium and discount schedule that would be considered equitable by most of the trade is, for practical purposes, impossible if there are considerable differences of opinion among traders with respect to the value of one brand relative to another. The greater the importance assigned to the brand name in the buying and selling of a commodity, the more difficult it becomes to incorporate these differences into a futures contract without conflicting with existing trade interest and practices. 15/

In the case of orange concentrate, the importance attached by the trade to brand names makes it extremely doubtful that it would be feasible to establish a futures contract that specified brand delivery. An examination of the importance of brands in the marketing of this product and of the specific implications to futures trading follows.

Price differentials among brands of orange concentrate indicate that the market recognizes differences among brands. All orange concentrate is required by Federal and State regulations to conform to certain minimum standards of quality. So long as the product of a given processor meets these standards, he receives a quality certification that, from the standpoint of the official inspection agency, is equivalent to that received by any other processor whose product meets or exceeds the minimum quality standards. Therefore, a processor who produces orange concentrate of a quality exceeding the minimum requirements can afford to do so only if buyers believe his product is superior to that of some of his competitors. Producers and the owners of different brands invest large amounts of money to advertise particular brands, with the objective of making the brand name partially symbolic of the quality of their products. Brand names are used as a partial index of quality in the marketing of this product, even though a given brand name may not actually represent a superior quality when measured against strictly technical quality standards.

Because of the importance that is given brand names in the selling of orange concentrate, it does not appear possible to set up premium and discount price differentials among brands that the trade would consider equitable for making delivery on a futures contract. The only satisfactory solution to such

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15/ The contracts used for futures trading in onions and potatoes permit delivery of any of several brands. However, the price premium or discount for delivery of other than the base grade is based on quality differences rather than the different name brands. All brands of the same quality are deliverable at the same price.

a problem is to divorce the quality differences among brands from the brand names. This would result in quality standards that have a common meaning to all buyers and sellers including, of course, buyers and sellers of futures contracts, just as, for example, the qualities of wheat have been given a standard meaning by various grade designations. However, it is doubtful that such a solution would be feasible in view of the importance of brand names.

Another facet of orange concentrate production that makes the problem of brand names an even more effective limitation on futures trading is that the product is packed in lithographed cans. 16/ Consequently, a high degree of personification characterizes the supply of orange concentrate at all levels of trade. Practically all the supply is directly identified with a specific firm or economic unit by brand name. Once orange concentrate is given such an identity, the ability to make further disposition of it at succeeding stages in the marketing process is pretty much limited to the firm identified or closely associated with the particular brand. This being true, the conditions would be unattractive, for example, to a buyer of orange concentrate futures who would have to take into account the possibility of receiving delivery of a brand that might resell only at a discount. In brief, the personalized nature acquired by orange concentrate supplies because of the use of lithographed cans introduces a considerable amount of inflexibility if traders wish to make further disposition of supply. 17/

Several Florida processing firms suggested the possibility of establishing a futures contract that would permit delivery of orange concentrate in bulk form. The trouble with this alternative is that there is only a limited market, if any, for orange concentrate in bulk form. Therefore, it would mean the setting up of a fictitious contract or unit of trade. Processors do, at times, carry some orange concentrate in bulk form (in drums or vats). However, they do not customarily carry this for later sale in bulk, but rather for blending or mixing with other orange juice that they expect to extract later in the processing season. Thus, orange concentrate is carried in bulk primarily to offset differences in the quality of juice due to varietal and seasonal characteristics of the orange crop. Because of the cost involved, most processors stated that they tried to minimize the amount carried in bulk. There is no active market for orange concentrate in bulk, and very little indication at present that there will be. Until active cash trading develops for orange concentrate in bulk, no purpose will be served by considering the merits of a futures contract for the product in bulk.

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16/ Some processors (apparently for reasons of flexibility) pack small amounts of orange concentrate in cans to which paper labels are attached. However, this practice usually has proven unsatisfactory as these labels may come off or wrinkle and cause a less attractive package under customary storage and handling practices. Thus, most of the output must be packed in lithographed cans to avoid these difficulties.

17/ If in the future there occurs a technological development that permits the brand name to be put on orange concentrate after the can is filled and closed, the possibilities for futures trading would be improved. However, this in itself does not appear sufficient to permit the development of futures trading in view of the other characteristics of the market already discussed.

Unlike the situation for orange concentrate, product differentiation by itself does not appear to be a factor that would limit the development of futures trading in oranges. Consequently, it is not discussed in this study.

## Information System

The development of futures trading is favored by a highly developed information system advising potential buyers and sellers about such things as supply, demand, price, and related factors. An efficient information system also means the absence of restrictions that limit the opportunity of buyers and sellers to make use of this information. To the extent that such basic information is lacking or is usable by only a few individuals, the possibilities for achieving a substantial volume of futures trading in a commodity are correspondingly limited.

The adequacy of the market information system, from the standpoint of the development of futures trading in a commodity, may be judged by the nature of the information available about the cash commodity and from the extent to which such information is usable by a large number of buyers and sellers. This provides a meaningful index, since any aspect of market information that permits individuals to buy or sell the cash commodity, or prevents them from doing so, will also tend to facilitate or impede the purchase or sale of that commodity on futures contracts.

Viewed from the standpoint of the measures set forth above, the market information systems for orange concentrate and oranges do not appear favorable to the development of futures trading. This is not so much because of a lack of sufficient information on supply, demand, and price, but rather because such information can in fact be used by only a small number of citrus firms. That limitation on present use of market information can be inferred from the nature of competition in the citrus trade. As was brought out earlier, firms compete for the ownership of oranges and orange concentrate primarily on the basis of price plus nonprice considerations. Therefore, it is rather obvious that use of information on supply, demand, and price as a basis for buying and selling these products is limited to the firms who can compete on such a basis.

Since the limitation on the use of market information is due to the character of competition in the citrus trade, its correction would need to come from modification of the competitive system. The direction here would have to be toward competition substantially on the basis of price, for when competition is of the latter type, the use of market information is maximized, since a potentially larger number of buyers and sellers can make use of it. It might be said that barriers to entry into markets as a buyer or seller are at a minimum when competition is substantially on a price basis and, hence, the maximum number of firms have the opportunity to use market information. The end result is, of course, a broader and more active cash market for the commodities concerned and, thus, a broader basis for futures trading.

The foregoing is not intended to suggest that the inability of a substantial number of firms to make use of market information is in any sense

indicative of a deficiency of the citrus market, but rather that the development of futures trading would be hindered by these conditions.

## Standardization of the Terms of Trade

All purchases and sales of commodities represent a form of contracting in which buyer and seller reach an agreement on the terms under which the exchange takes place. They must, for example, agree on the quantity, quality, place and conditions of delivery, and the price and method of payment. In some types of sale contracts, the terms are arrived at by personal bargaining between the parties and, thus, can be made to conform to the personal preferences of the individual parties. There are other types of exchange contracts, such as commodity futures, for example, where the terms of the contracts are highly standardized for all buyers and sellers. The terms of commodity futures are so standardized that buyers and sellers cannot bargain over anything but price and the month of delivery. For example, such terms as the unit of trade, quality, and place and conditions of delivery are standard for all traders.

Standardization of the terms of futures contracts is a necessary condition for organized futures trading. For without a high degree of standardization, it would not be possible to achieve the volume of trading and, hence, the liquidity observed in many of the modern futures markets.

However, the standardization of terms of commodity futures contracts necessarily means that it is, for all practical purposes, not possible to establish a contract that satisfies the special interests of all segments of the trade. The matter of delivery point serves as an example. The interest of some firms may be served better if delivery point "A" is selected as the future delivery point, whereas delivery point "B" would best serve the interest of another. Consequently, the terms selected for futures contracts must necessarily reflect a compromise of trade interests.

The maximum participation in futures trading requires that each term be selected so as to be appropriate to most of the trade. However, in view of the diversified nature of trading in some commodities, it may be difficult and, in some cases, impossible to identify enough uniformity among trading practices to determine contract terms that are representative of the majority interest. If this is the case, trade support of futures can be expected to come primarily from a minority group. Consequently, if a futures contract in orange concentrate or oranges is to attract the support of a major segment of the citrus trade, conditions must be such that it is possible to select contract terms that appeal to the majority. The possibility for doing this is suggested by the degree of uniformity in the terms currently used in buying and selling these commodities.

In the case of orange concentrate, there appears to be a sufficient degree of uniformity in trading to establish satisfactory terms for a futures contract with respect to time, place, and quantity. However, this is not true for the quality provisions. The absence of quality terms that are standard among most buyers and sellers of orange concentrate is attributable to the present practice

of buying and selling orange concentrate according to brand names. Each group of buyers and sellers of a particular brand can be expected to agree closely on its quality; however, they may not when other brands are brought into the picture. The more brands involved, the more difficult it becomes to arrive at a consensus among the trade as to the quality differences among brands. A solution of this problem satisfactory to most of the buyers and sellers would necessitate the establishment of quality specifications that are independent of brand names.

In the orange trade, there seems to be a sufficient degree of uniformity in the terms of purchase and sale to establish futures contract terms that would be in accord with those used by a major segment of the citrus trade. However, in light of certain characteristics of oranges, there is considerable question of the possibility of incorporating these into a workable futures contract. First, oranges are highly perishable once they are pulled from the tree and, therefore, there is little commercial storage of oranges. Thus, there is no accumulation of oranges in quantities greater than those required to meet current marketing or processing requirements. Therefore, the availability pattern of oranges is of a "pipeline" character, as contrasted with the pattern of other commodities traded on futures contracts -- wheat, for example -- of which, through storage, supplies accumulate beyond immediate needs.

The pipeline supply pattern is much the more sensitive of the two to conditions that may involve sudden changes in the allocation of supplies. For example, the immediate need for supplies to satisfy the demands of those who wish to settle their futures contracts by delivery is likely to be of little economic consequence if supplies can be obtained from storage without interfering with the quantity needed to satisfy current production requirements. Conversely, if the satisfaction of delivery requirements involves drawing supplies from immediate production requirements, the regular processes of production are impeded, a consequence that is reflected in what is customarily referred to as "delivery-month squeeze."

Thus, when futures trading is established on a supply base of the pipeline type, traders are confronted with a high degree of uncertainty with respect to whether supplies will be available in quantities sufficient to assure orderly settlements in the delivery month without interfering with other current supply requirements. This type of uncertainty, of course, acts to limit the development of futures trading and is particularly important to oranges in view of the pipeline characteristics of supply and the tieup of supply within the pipeline.

In the absence of new developments that make off-tree storage of oranges a more feasible and profitable operation than now, the only way of minimizing the pipeline character of orange supplies is to establish a futures contract that permits "on-tree delivery." Although certain changes occur in their interior quality, oranges can be kept on the tree for several months. Thus, the longest period of storage for oranges, if it can be considered as such, takes place on the tree. Conceptually, at least, it would be possible to have an orange futures contract that permitted "on-tree" delivery. Practically speaking, however, the technical problems involved appear to rule out the feasibility of attempting such a contract.

## The Relationship of Futures Trading to Financing

One of the potential uses of futures trading is that of enabling the owners of the commodity to obtain short-term financing or working capital, as is discussed in greater detail in the Appendix. In the case of Florida citrus fruit and citrus products, the processors of orange concentrate are the principal owners of orange concentrate and, therefore, are the firms which should have the greatest potential interest in using futures as a means for acquiring working capital. Through various techniques of integration, they assume the major share of the ownership of orange concentrate from the time of production to its sale at or near the consumer level.

However, the fact that processing firms are the principal commodity firms and, hence, the ones that could most logically use futures as a means of financing provides no assurance that they would so use futures trading if given the opportunity. This is because the processor's choice of futures trading as a means of financing must take into account the possible economic consequences of this method of financing to his business as compared to the consequences of alternative financing arrangements. From a comparison of the alternative financing methods available, the processor will select the one that is most consistent with his overall business objectives.

In considering futures trading as a financing alternative, processors must take into consideration several factors. Their use of futures for that purpose, for example, results in a division and transfer of a substantial part of the ownership responsibility to buyers of orange concentrate futures contracts. Consequently, the buyer of futures becomes the recipient of the gains or losses associated with ownership of orange concentrate during the period that the processor has concentrate hedged with futures contracts. The processor obtains financing but gives up part of his enterprise responsibility to the buyer of futures; that is, the processor, in effect, becomes less integrated.

There is no way of knowing with certainty whether these consequences are sufficient to preclude any processor interest in using futures trading for financing. However, in view of the present organization of processing firms and the continued development of the industry on a more integrated pattern, there is more basis for supposing that these firms have little, if any, interest in using futures as a financing device. Other financing alternatives, such as sales of securities, are more consistent than futures trading with the retention of the present pattern of ownership.

Although vertical integration is perhaps sufficient to rule out processor interest in futures trading as a financing alternative, additional insight on this question is provided by an examination of the strength or weakness of the working capital position of processing firms. The difficulty that processors have in obtaining adequate working capital through existing financing arrangements may be interpreted as an indication of their interest in using futures as a financing alternative. Accordingly, one phase of this study was directed toward determining the working capital position of the firms processing orange concentrate.

Most Florida processing firms use their inventories of concentrate as a basis for obtaining bank financing. Under this arrangement, they are permitted to borrow 60 to 70 percent of the market value of concentrate. Relative to most commodities now traded on futures contracts, the percent of market value loanable on concentrate is low. On cotton, banks customarily loan 85 percent of the market value, provided it is hedged with cotton futures. Accordingly, one might reason that the 60 to 70 percent loan limit on concentrate imposes effective restrictions upon the amount of working capital obtainable by processors and, therefore, suggests a basis for their having an interest in concentrate futures.

However, examination of this point indicated that the present loan limits on concentrate inventory do not impose restrictions upon the ability of processors to obtain what they consider adequate working capital. This conclusion is based upon statements of processors and on balance-sheet information. This information indicates that most processors do not find it necessary to borrow as much on concentrate inventory as they are permitted to under the present banking requirements. For example, for the 1953-54 season, several firms reported having to borrow only 30 percent of inventory values, whereas others reported the use of open lines of credit that did not involve any use of inventories as a basis for credit. Most of the firms stated that the present bank requirements did not interfere with their ability to obtain working capital.

Processors were questioned as to whether or not their use of concentrate inventories as a basis for obtaining bank financing was conditioned by the bank's right to impose what is referred to as "step-up rates of sale." Under this practice, banks make loans on condition that they can require the firm to increase its rate of sale if the bank feels that the firm's current rate is too slow. Processors reported that this condition has never been imposed. That fact suggests strength rather than weakness in the working capital position of processors.

It seems reasonable to conclude that the present short-term financing arrangements are adequate for processors. Processors presently have basically strong short-term capital positions. Part of the strength of their working capital position is accounted for by seven firms who employ the cooperative type of business organization. All seven of these firms apparently have strong working capital positions, partly because their grower-members represent an important source from which the firms obtain working capital. The contribution of financing by grower-members comes about because growers generally do not receive full payment for the fruit that goes into the manufacture of concentrate until the concentrate is sold. Insofar as the firm is concerned, the supplying of fruit and the waiting for payment until the fruit is sold in finished form are the equivalent of a cash sale by the grower and a loanback of part of the proceeds to the cooperative. In this way, grower-members satisfy part of the short-term capital requirements of the firm. Pertinent to this point are the following observations made in an earlier study: 18/

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18/ Hoofnagle, William S., Samuels, J. K., "Acquiring Citrus Fruit for Concentrating by Processors in Florida," Bur. Agri. Econ. and Farm Credit Admin., Cooperative Research and Service Division, Misc. Report No. 173. May 1953.

"Unlike growers who sell for cash, the members of a cooperative carry the risk of concentrating and selling. Grower-members indirectly maintain ownership of the product until it is sold to wholesalers or distributors, and, thus, financial losses in inventory because of adverse changes in the retail price level fall directly upon the growers . . . Members of the cooperative bear the cost of manufacturing frozen concentrated orange juice, or financing the inventory, and the price risks."

In view of the grower-member's role in reducing the short-term capital requirements of the cooperative processing firm, there is little basis for expecting such firms to have a real problem in obtaining adequate working capital. None of the cooperative processors expressed any interest in using concentrate futures as a means for financing.

The information suggests that most Florida processing firms have strong capital positions. This status is, of course, always subject to change. In the event their financial position became weaker, as it might do after an unprofitable season, Florida processors might have a greater incentive to use futures trading for reasons of financing.

It should be remembered that this analysis of the possibilities for the development of futures trading in orange concentrate and oranges is applicable to the present time. In the event of new developments in the citrus markets, it may be advisable to reexamine the questions considered in this report.

# APPENDIX

## Futures Trading as It Relates to Financing, Production, and Marketing of Commodities

The body of this report gave considerable emphasis to the financial organization of the citrus industry, that is, to the pattern of ownership within and among the firms engaged in the production and marketing of orange concentrate and oranges. Such emphasis was given because the development of futures trading depends to a large extent on the degree to which such trading is consistent with the existing financial organization of the citrus industry.

This addendum to the study is provided primarily for those readers who are interested in some of the theoretical concepts that underlie the view that futures trading is best understood when considered as a part of the financial system of commodity markets. However, it is not intended by any means to be either a complete or rigorous development of the subject.

The financial system includes the many means through which the ownership of goods of various kinds is separated from their physical control or use. It is typified by the system of debt, credit, securities, financial assets, liabilities, and commodity futures contracts for commodities so traded. Because of the financial system, the ownership of goods can be divided into separate components and each component separately transferred. Thus, the ownership of goods becomes more completely separable from the use of the goods themselves.

For example, the rental contract permits the ownership of a farm to be separated from its physical operation. Thus, some individuals are permitted to assume the responsibilities associated with farm ownership without at the same time having to engage in farm operation, whereas others can engage in farm operations without having to acquire complete rights of ownership to the farm. They merely need to acquire rights to use the land through rental. Through such devices or rental arrangements, the capital requirements for farm ownership and farm operation can thus be provided by different individuals rather than one individual.

The limits to which the ownership of goods can be separated from their physical control and use and hence the degree to which specialization in the activities associated with the production and marketing of goods can be carried has no clearly definable limits. It can be carried just as far as individuals are willing to go in acquiring or giving up various rights necessary to achieve a particular area of specialization. Usually these limits are fixed, on the one hand, by the extent to which there are opportunities for specialization and, on the other, the availability of the type of financial instruments necessary to take advantage of the specialization possibilities. For example, commodities like grain and cotton provided a potential opportunity for separating the physical storage of these commodities from the holding of title. This division was achieved through the warehouse receipt. Thus, the business of custom warehousing of commodities and the warehouse receipt was an outgrowth of the

demand of two groups, each of which wished to specialize in a particular phase of activity associated with commodities. On the one hand, some holders of title to commodities wanted means whereby they would not have to invest capital in physical storage facilities but instead limit their capital to the purchase of storage service. On the other hand, certain nonholders of title wanted to invest capital in physical storage facilities and sell storage service without having also to invest capital in the full ownership of commodities.

In ways much similar in principle to those of rental contracts and the warehouse receipt, futures trading arrangements permit the ownership of commodities to be more completely separated from their physical control or use. Consequently, the responsibility for the principal activities involved in the production and marketing can be divided so that the same firm need not invest its capital in any more rights of use than needed to carry on a particular type of activity. By the principal activities in production and marketing are meant the growing of the crop, the transfer of commodities from one form to another through processing, from one place to another through transport, and from one time to another through storage. The separation made possible by futures trading is that of enabling the transfer of commodities from one time to another to become a substantially separate type of enterprise. This is perhaps the simplest type of enterprise, that is, the transformation of present commodities into future commodities (henceforth to be referred to as the time transfer of commodities). However, it is equally as important as other types of production and marketing activities, as someone must invest capital in the carrying of commodities during the entire period involved in the movement of the commodity from producer to consumer.

An individual can invest capital in the time transfer of commodities in one of two ways. He may buy title to commodities and hire storage service for the interval. For example, a firm that wished to invest capital in the transfer of wheat from, say, December until the following March could do so by buying title to wheat in December and hiring storage service from December until March. Alternatively, the firm can invest in the transfer of wheat from December until March by buying in December a wheat futures contract that specifies delivery in March of wheat of comparable quality and location. In choosing to invest in the transfer of wheat from December to March by buying a March wheat future rather than buying title to wheat plus a lease of storage space, the individual allows someone else to retain control of the wheat and provide for its storage.

Thus, futures trading arrangements enable individuals to invest in the transfer of commodities from one time to another without having to purchase title and right to physical control of commodities during the interval of transfer. This result is achieved because futures contracts and the system for trading in such contracts permits individuals to buy and sell ownership rights to commodities under conditions where the integrity of such rights is maintained by providing for ready convertibility of the contracts into the commodity itself or its equivalent in money. Anyone who invests capital in acquiring rights to commodities in the expectation of realizing a yield from selling or using them in the future assumes the particular enterprise responsibility of transferring commodities through time.

The fact that purchases of commodity futures enable individuals to invest capital in the transfer of commodities without having to acquire title and physical control is quite important to those firms whose business requires the purchase of title and physical control of commodities in order to move them from farmers to consumers. Such firms are providing opportunities for shifting the responsibility for the time transfer of commodities to buyers of futures. Consequently, buyers of futures can supply the capital requirements for carrying the commodities over time. In not having so to invest their capital in the carrying of commodities, they are able to acquire title and right to physical control and use of a larger volume of commodities and, hence, do a larger processing or merchandising business with any given amount of their own capital. Moreover, since capital must be invested in the time transfer of commodities during all other phases of production and marketing, the ability of holders of title to use futures to separate and transfer to others this type of responsibility enables such firms to specialize in such services as merchandising, storage, and processing, to mention a few possibilities.

That futures trading enables commodity firms to achieve results such as those described can be brought out through a careful examination of what is involved when firms hedge commodity purchases with sales of commodity futures contracts. For example, a firm on December 1 makes a purchase of spot cotton of the same grade and quality delivered on futures contract and at a location that coincides with a futures contract delivery point. It pays 30 cents a pound for the spot cotton. Simultaneously, the firm sells a March cotton futures contract for 30.50 cents a pound. As a result of these transactions, the cotton firm acquires title to cotton through its spot purchase but immediately gives up to the buyer of cotton futures all rights of ownership in an equivalent quantity of cotton on and beyond the March delivery date.

Aside from the location of title and the flow of payments, each of the parties might have achieved almost the same results in this way: Instead of using cotton futures, the buyer of futures purchases the cotton on credit for 30 cents a pound and leases the cotton to the manufacturing firm from December until March, paying it .5 cents a pound (equivalent to a payment for storage), or the difference between the prices in the spot and futures transactions. The firm then agrees to return cotton of an equivalent quantity and quality at the same price on the March delivery date. Furthermore, it would be necessary to incorporate a provision such that either party can resell to a third party on or before the March delivery date its remaining interest in the leasing arrangement. The latter provision is extremely important since it assures each party that he can either sell his remaining interest in the leasing arrangement at any time during the interval or retain it irrespective of what the other party decides to do. Employing the futures trading alternative, the hedging firm can sell out its remaining interest in the leasing arrangement by purchasing a cotton futures contract to offset the one previously sold. This transfers to a third party its obligation to return an equivalent quantity of cotton. Similarly, the buyer of futures can sell to a third party his ownership rights in cotton for the remaining part of the interval by selling cotton futures to offset the futures previously purchased. Using either alternative, the firm would acquire the right of possession and physical control over the cotton during the December-March period, whereas the major right in ownership of cotton would, in the case of hedging, reside with the buyer of cotton futures.

A logical consequence of a futures trading arrangement making it possible for the firm to acquire rights to possession and physical control over cotton, while the buyer of futures retains the major rights in ownership of the cotton, is a corresponding division between the two parties of the responsibility for providing the capital requirements. In the illustrative example, the hedging firm's net investment of capital in the ownership of cotton is, for the most part, limited to that necessary to obtain the right over cotton for 3 months in carrying through the service of storage. The net investment of the buyer of cotton futures in the ownership of cotton is represented by the price paid for the futures contract times the quantity of cotton purchased. Thus, in assuming the major share of the ownership responsibility for the cotton, the buyer of futures also assumes the major share of the responsibility for providing the capital required to transfer cotton from one time to another.

In the sequence of transactions whereby a firm such as that described hedges a commodity, ownership of the commodity may be financed by bank loans. The procedure here is typically one in which the bank makes loans to commodity firms against which it holds warehouse receipts to the commodities purchased. Usually, banks lend a higher proportion of the market value of commodities, if the firm hedges these with sales of commodity futures, than they lend to a nonhedging firm of the same financial rating. In other words, the banks require a higher ratio of loans to equity capital for nonhedged than hedged firms. This aspect of finance is generally the only way in which futures trading is thought to be connected with commodity financing. The financing problem of the hedging firm is usually described solely in terms of the equity capital supplied by the proprietor and loan capital supplied by the bank. Consequently, the buyer of futures is left out of the explanation of where the capital provided comes from.

That buyers of futures invest capital in the time transfer of commodities may seem somewhat far fetched in view of the fact that payment by the parties to futures transactions is deferred. However, "credit" is a salable asset and, hence, is part of the capital that may be committed to the purchase of ownership rights to commodities. 19/ It is by the commitment of his credit that the buyer of futures invests in commodities. In the buying of commodity futures, he pledges his credit to assume ownership responsibility for a corresponding quantity of commodities from the time that he purchases the futures contract until he liquidates his position either through a sale of futures or sale of the actual commodity.

The degree to which the credit pledged by the buyer of futures is, in practice, a meaningful form of investment depends upon certain conditions. First, there must be practically no question as to the financial responsibility of either the seller or buyer of futures from the standpoint of performance of

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19/ As used here, credit is defined as the ability to sell debt. For example, an individual who obtains a loan from a bank, in effect, issues a claim against himself to pay money at a future date; that is, he sells part of his credit for cash. Therefore, credit is part of an individual's or firm's salable assets and, hence, part of its capital.

obligations assumed. Such a guarantee of performance is provided through the organization and rules of the clearing house and the commodity exchanges. In light of the present-day rules of trading, margin requirements, and rights of brokers to liquidate the market position of those who are not financially responsible, there is practically no uncertainty as to the security of futures contract obligations. They are as safe as money in the bank, so to speak. Second, the terms of the futures contract must be such that they are highly descriptive of supplies of the commodity actually handled by hedging firms, both as to quality and location. Otherwise, the prices of actual commodity and futures contracts become unrelated and, to the extent that this occurs, the effectiveness of futures trading as a means for permitting buyers of futures to invest in commodities is diminished. Finally, the conditions of convertibility of futures contracts into commodities or money must be such that the prices established reflect substantially competitive considerations.

The discussion so far has been concerned with the way firms use futures trading in connection with the accumulation of commodity inventories. They also may use commodity futures in connection with the sales of commodities for deferred delivery at firm prices in advance of having purchased the commodities to cover such sales. For instance, sometimes cotton merchants contract to sell a specified quantity and quality of cotton to mills at firm prices several months in advance of buying the cotton. Against such sales to mills a merchant may purchase an equivalent quantity of cotton futures contracts for delivery at a time that coincides as closely as possible with the time at which he expects to purchase the spot cotton to fill the mill's order.

The significance of using commodity futures in this manner can be brought out by identifying the responsibility of the mill, merchant, and "short seller" in an illustrative example. Let us suppose that on May 1, a cotton merchant contracts to sell a mill 100 bales of cotton for 30 cents a pound or $15,000, delivery by the merchant and payment by the mill to be made the following November 15. Also, assume that the merchant does not own any cotton, but rather plans to purchase it in the early part of November.

As a result of this contractual arrangement, the mill commits $15,000 toward the production of cotton in the form of its credit obligation to pay that amount upon delivery of 100 bales of cotton November 15. The merchant, on the other hand, obligates himself to either produce or acquire the cotton and deliver it to the mill in exchange for $15,000.

If the merchant is to receive a reasonable margin of profit from a sale of cotton at 30 cents, he must acquire the cotton in November for a lower price. Let us suppose that he will need to purchase the cotton at 29 cents in order to realize a satisfactory return for his exchange with the mill. However, at the time of entering the contract in May the merchant has no way of knowing what price he will have to pay for the cotton in November. He may have to pay more or less than 30 cents. Should he have to pay more, it will mean that the $15,000 invested by the mill will have proved to be inadequate to cover the cost of acquiring the cotton plus a return to the merchant for his services. The additional capital needed to acquire the cotton will have to be provided by the merchant, since he is obligated to deliver 100 bales of cotton no matter

what the cost. The additional capital provided by the merchant, because of an increase in the price of cotton from May until November, represents a loss to the merchant.

The only way that the merchant can be sure that the mill's investment of $15,000 will be sufficient to cover his cost of acquiring the cotton plus a return for his services, and thereby relieve him of the responsibility for making up the capital deficiency should that arise because of price increases, is to find someone who will agree in May to supply him with 100 bales of cotton or its money equivalent in November. Further, this party must be willing to supply it at 29 cents a pound so as to assure the merchant of a 1-cent margin of profit a pound, or $500 on the 100 bales.

The party who, on May 1, is willing to supply the merchant with 100 bales of cotton at 29 cents a pound in November or the money necessary to purchase 100 bales is the "short seller" of cotton futures. That he will supply cotton at 29 cents a pound is made on the assumption that this is the price in May at which the merchant can buy 100 bales of November cotton futures. The merchant can, in effect, enter such a contract with the short seller by purchasing 100 bales of November cotton futures at 29 cents a pound to offset his sale of cotton to the mill for 30 cents a pound.

If the merchant was sure that the quality of cotton to be delivered on futures is identical in quality with that contracted to the mill, he could take delivery on his futures contract and redeliver the cotton to the mill. In these circumstances, the offsetting of the forward sale of cotton to the mill with a purchase of November cotton futures would, in effect, transfer to the "short seller" of the November cotton futures contract the responsibility for providing, in the case of an increase in the price of cotton between May 1 and the date of delivery of cotton on the November futures contract, an amount of capital equal to the difference between the $14,500 at which the merchant contracted to buy November cotton futures and the amount that is required to purchase the spot cotton or a futures contract on the November settlement day. For example, if the settlement price in November is 32 cents a pound, the "short seller" supplies capital to the amount of $1,500 or $15 a bale. If the short seller of cotton futures did not provide such capital, it would have to be done by the merchant. Thus, through the offsetting of the forward sale of cotton to the mill with a purchase of cotton futures, the capital required to acquire cotton at a future date is made a joint responsibility between the merchant and short seller.

In reality, the merchant has little assurance that he can take delivery on his futures contract and receive cotton of a quality that is identical with that contracted to the mill. This is because sellers of cotton futures are permitted to make delivery of any of several qualities at premiums or discounts from the basis contract grade. Consequently, the merchant generally has to buy in the spot market the specific qualities required to fill the mill order, and liquidate his position in futures by offset. In other words, at the time that he buys the spot cotton he liquidates his position in futures by a sale of November cotton futures.

However, the fact that the merchant generally must acquire in the spot market the specific quality of cotton sold to the mill, rather than on the futures contract, in no way alters the principle that through the offsetting transactions described the responsibility for providing the capital necessary to acquire cotton at a future date is made a joint responsibility of the merchant and short seller. To the extent that the prices of futures and spot cotton do not represent financial equivalents at the time of settlement, the merchant is confronted with uncertainty as to what his share of the capital requirements will be, and hence that of the short seller. If this uncertainty is, from the merchant's point of view, less than the uncertainty that confronts him if he did not make the offset, then he can be expected to offset his mill sale with futures.

In summary, futures trading arrangements enable ownership to be separated from physical goods in ways such that buyers and sellers of futures can assume responsibility for the outcomes of decisions to transfer goods over time, without having to engage in the physical activity of storage; and marketing firms can limit their responsibility to supplying services such as merchandising and processing, without having to assume the responsibility assumed by buyers and sellers of commodity futures. 20/ Thus, futures trading as a part of the financial system of commodity markets has important implications to the organization of production and marketing activities among firms. As applied to the economy as a whole, "the principal function of the financial system is to separate the ownership of real capital from its control; that is, to enable people to administer real capital without owning it, and to own it without administering it." 21/

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20/ A good deal of support for this observation on the nature of futures trading is furnished by a statement of a cotton merchant, excerpts of which follow: "When both the producer and consumer of cotton decline to carry the surplus, somebody in between must do so. If there were not cotton futures exchanges, the surplus would of course get carried, and by speculators, but at a much lower level of values than under modern conditions whereby a speculator, having no facilities for buying, storing, financing, insuring and selling the spot cotton and lacking the necessary experience in and knowledge of such matters, is enabled to acquire a market interest in cotton through the facilities offered by the cotton futures exchanges." Statement made by W. L. Clayton, of Anderson, Clayton, and Co. Hearings before the Committee on Agriculture and Forestry, U. S. Senate, 74th Congress, 2nd session, To Investigate the Causes of the Decline of Cotton Prices, Part 1, February 17 to March 31, 1936, p. 436.

21/ Boulding, Kenneth, A Reconstruction of Economics, 1950. P. 276.

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