Commodity Oil Markets and How They Work

THOMAS E. DOAK, Lever Brothers Company, 390 Park Avenue, New York, New York 10022

ABSTRACT

Basic steps in the operation of commodity oil markets are described, from relatively simple markets (palm, coconut, and corn) through the sophisticated soybean oil market that affects prices of fats and oils worldwide. Also discussed are basic trading and economic functions provided by changing prices.

INTRODUCTION

In groping for an approach to the subject, "How Commodity Oil Markets Work," I've had to assume that, while most readers are deeply into fats and oils chemistry and product development, some may not have been exposed to actual trading systems and functions. This discussion is *not* for the sophisticated trader, and it's *not* my purpose to make price analysts or traders of anyone.

The oil markets (and oil traders) owe a big debt of gratitude to chemists for help in establishing suitable standards for oil quality and appropriate allowances to roughly equalize the value of quality variations among different lots of oil. These "final settlement" adjustments make it much easier to concentrate on price, shipment terms, and payment terms.

An oil market functionally must bridge the physical distance and time gaps involved between actual production and actual consumption by end-product manufacturers. The producer of the oil wants as much as he can get – the consumer wants to pay as little as possible. Problems arise immediately; the consumer rather typically doesn't want to buy when the producer wants to sell; the oil is produced a long way from the consumer and often much earlier than the consumer will use it. Quality is variable, and quality deterioration in storage is to be expected. International barriers often must be hurdled. Financial security is a must; procedures for settling altercations must be provided. The distribution system requires a complex structure. Markets range structurally from the producer/few-consumer markets (without middlemen), through increasingly complex systems, to the rather sophisticated system typically used in soybean oil trading.

THE SIMPLE MARKETS

I am referring to structure when I mention simple markets, not price risk.

There are still a number of very simple markets, one-buyer/one-seller or few-buyers/few-sellers. The classic case not so many years ago involved whale oil, 90% of which traded between a sellers' group and a large consuming company. In theory this created a possible price range of zero to infinity. The nervous broker who negotiated this transaction devoted himself exclusively to this project; it represented his sole income for the year. It was jokingly said that the participants could tell when the final agreement was imminent by counting the number of packs of cigarettes consumed daily by the broker.

There are still examples of this type of market in the beginning phases of production of a promising new oilseed. The grower may want to experiment, but he often needs a negotiated contract with a crusher or export dealer to induce him to shift from traditional crops. The crusher in turn may not be willing to sign up the grower without having a known market for the oil or the meal by-product (or both). This means a tremendously long lead-time. In the early days of safflower, I contracted for oil in early November to enable crushers in turn to sign up acreage seeded in February/March, harvested and crushed in August/September, and consumed over the next 12 months.

I also did much the same thing in the early days of sunflower, buying oil in February for harvest in October, for our consumption during the next 12 months.

In retrospect, risks were enormous, especially since the products we had in mind were only experimental. We have won some of these gambles – others left financial scars.

Corn oil trades in another fairly simple type of oil market; producers and consumers are few, and international production and trade are relatively small. Buyer and seller mostly reach their bargain stipulating quantity, shipment period, quality terms and quality adjustments, who will transport, and how payment is to be made. When agreement on a price proves too difficult, they may hurdle this by agreeing to establish a price at any future time prior to shipment, by reference to quoted prices at a given time. Intermediate speculator dealers have been relatively few.

DEALER MARKETS

"Dealers" prefer to call themselves "merchants" but the dealer appelation is more descriptive.

This structure still dominates the import/export oil market and was characteristic of soybean oil before the Chicago Board of Trade instituted the present futures contract in the early 1950s.

A slightly simplified structure might be 40 crushers, 40 consuming refineries, and a dozen or so brokers paid a relatively small commission to solicit bids and offers and, frankly, to gather and disseminate market information. They are also diplomats; both buyer and seller can get "testy" at times.

With small changes, this is the palm and coconut oils system minus a few sophisticated techniques I'll discuss later.

A schematic diagram of trading sequences is shown in Figure 1. This chart can be regarded as the Pacific, with producers on the West and consumers on the East. It should also be understood that it represents any time period between the initial trade for a particular shipment period and final arrival at a U.S. port (perhaps 90 days later – but I have seen arrivals at least 6 months after date of shipment).

In the first trading sequence a producer, who cannot locate a consuming buyer at the price, sells to Dealer A at 27-½ cents, the market rallies, and Dealer A sells to Dealer B at 28-½ cents (an apparent profit of 1 cent). The rally fails, and Dealer B sells to Dealer C at 25-7/8 cents (to prevent further loss). The sequence then moves from C to D, D to E, E to F, F to G, and G to H. Prices by this time are quite attractive to a consumer who buys from Dealer H at 20 cents.

Note that both producer and consumer obtained excellent prices and that, while an occasional dealer made a small profit, the algebraic total of the dealer transactions was a combined loss of 7-½ cents.

This sequence of trading is called a "chain" in the language of the trade.

Let's look at another chain in Figure 2. In this one prices seem low, and a refiner wants to buy but can't locate

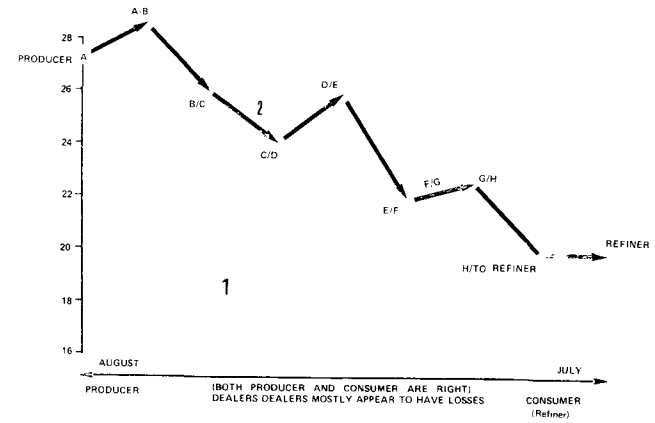

FIG. 1. How "dealer" markets function.

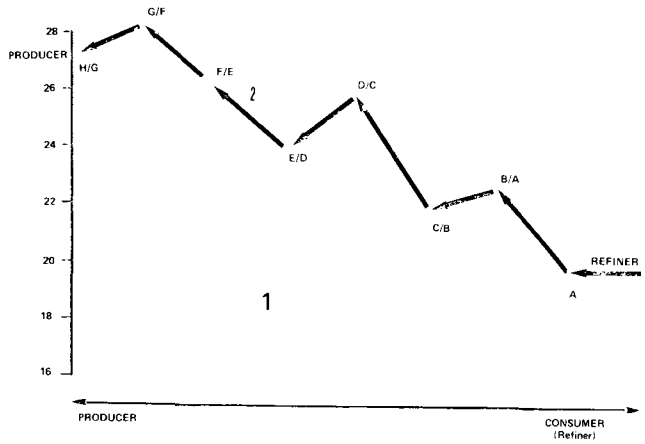

FIG. 2. How "dealer" markets function (cont.).

a producer willing to sell. Here the refiner buys from Dealer A, and the chain works progressively back until Dealer H finally covers from a producer at 27-½ cents. Here again the (astute) refiner made an excellent buy and the (astute) producer an excellent sale.

The unfortunate dealers collectively took a 7-½ cent loss, with only an occasional small profit to an individual dealer in the chain.

Don't infer this is the usual result of dealer trading or there soon wouldn't be any dealers left. In fact, dealers must be either foolhardy or very astute to risk heavy capital sums in speculative trading. It is their intention to make their "risk transfer" function profitable.

Also don't infer that an initial trade (in what finishes up as a complete chain) needs to begin with either a producer or a consuming refiner. Dealer trading rather typically might start between two dealers in the middle – in fact, the great volume of total trading is done in dealer-to-dealer transactions.

Let's look at another trading sequence in Figure 3 in which A sells to B who sells to C who sells to D who sells to A, diagrammed here as a neat "circle." In this case if all parties finally discover that a circle is complete without involving a producer, cash settlements are made among all parties and no goods actually move.

It is also obvious that a long completed chain may eventually prove to have made one or more circles. In these cases the chain of documents by mutual agreement can bypass the circle with contract profits or losses within the circle settled by simultaneous cash transfers.

How long are these chains? I've seen a circle involving 42 parties; document-passing from hand to hand is obviously tedious and time consuming.

Also note that it is very difficult to determine that

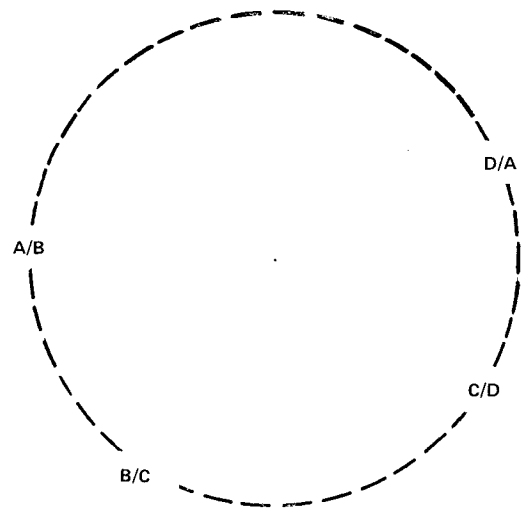

FIG. 3. Circle trading sequence.

circles exist; there is no "clearinghouse" that traces all these sequences until all official tenders of good have finally been completed.

Notice also that bankruptcy risks are large; it is difficult or impossible to know whether some dealer is getting over-extended. The test comes when documents are presented *sequentially* to each link in the chain; only then can it be discovered that the dealer has suspended payments or has gone into bankruptcy.

It can also be noted from this that the volume of transactions far exceeds the physical volume of goods exported. On some days "trading volume" will be enormous; at other times "liquidity" is totally lacking.

DEALER PROTECTIVE TACTICS

Let's return to the first chain in Figure 1 for another look. Actually, some of these dealers with big apparent losses may not have had a combined trading loss in that oil at all. When the market faltered and they could not locate a buyer, they may have "hedged" by initiating a sale in a later shipment position. This hedge would roughly equalized profits and losses for the pair of transactions. Remember we are only sketching one chain at a time; in actuality many exist simultaneously.

SUMMARY POINTS IN DEALER TRADING

1. The system is widely used and is very useful.
2. The dealer market often lacks "fluidity" or "liquidity."
3. Risks are enormous, and it is almost impossible to keep track of each party's current financial solvency.
4. "Paper work" is tedious since documents physically pass through many hands.
5. We've caught a glimpse of "risk transfer" through "hedging."
6. There is a lack of minute-to-minute knowledge of price movements; many trades are not publicized.

SOYBEAN OIL – A SOPHISTICATED TRADING SYSTEM

Imagine for a moment that you are either a seller of oil for an oilseed processor (crusher) or a buyer for a manufacturer of consumer products (refiner). Remember that oil prices are volatile; doubling or halving of price is not unknown in single seasons.

Let me ask you a few questions, some of them so obviously silly that no answer is required.

(Silly) Question Number 1: "Do you want to avoid big profits in oil trading?"

(Silly) Question Number 2: "Do you want to avoid heavy trading losses that could be big enough to destroy the firm's profits or even impair its working capital?"

(Silly) Question Number 3: "Do you want to keep your shareholders, your management, and your bankers all happy?"

(Serious) Question Number 4: "Would you be willing to give up major trading profits to eliminate the risk of big trading losses, particularly if this is the only way to keep your raw materials flowing, your manufacturing margins intact, and your bankers happy?"

Possible Answer: "Maybe Question Number 1 isn't entirely silly."

Question Number 5: "Do you want buyers available whenever you want to sell something? Conversely, do you want a lot of sellers around whenever you want to buy?"

Answers: "That takes a lot of buyers and sellers in one bunch?" "Everybody needs a *fluid* market in order to get business done quickly."

Question Number 6: "Do you want to know where the market is all the time – even far out forward?"

Possible Answer: "It sure makes buying, selling, and planning a lot simpler."

Question Number 7: "Do you want to trade without much risk that any of your principals will 'go belly-up'?" (Note: Little fish and very big fish have one thing in common when they die – they "go belly-up" – now generic slang for bankruptcy.)

Answer: "Obviously."

Present operations of the Chicago Board of Trade evolved to resolve questions like these, originally for the grain trade and much later for the soybean trade. Quite literally inventory or total ownership of soybeans was (and is) sometimes so enormous that a major price decline could exceed the net worth of the crushers. The present soybean oil contract procedure is less than 30 years old – stemming from these necessary "risk control" measures used by the soybean crushers.

Let's examine a few trade terms:

"Market liquidity" ("fluidity"): The cast of players is enormous: 1,200 members in the Chicago Board of Trade and thousands of actual participants each interested in achieving his own goals. Trading volume is staggering; many products trade twentyfold or more during a single season. Three times the annual production of U.S. soybeans, for example, traded in the futures market during the month of March. Even in such a system, however, there can be times when fluidity is lacking. Lack of fluidity is at a maximum whenever "trading limits" are imposed that are smaller than market forces require. "Limit-up" and "limit-down" days effectively block "liquidity."

"Risk transfer": The Board of Trade is very proud of this term. The first four questions I posed could be and mostly are resolved by "risk transfer" (still leaving room for some processing firms to trade for profit to the degree they elect). The majority of risk can be transferred to the speculators whose main objective is to trade in risk to make a profit, or to any other buyer or seller operating in the futures market.

"Financial solvency": The Board of Trade requires initial margins (say 10%) of the value of any transaction to be on deposit with the roughly 140 "clearing members" responsible to the "clearing corporation." Additionally, all margins must be maintained; if you have losses at the end of the day, you must pay up immediately. Conversely, you may withdraw any winnings each night. It's a true "pass-cash" system that prevents massive debt buildups such as are inherent hazards of the dealer system.

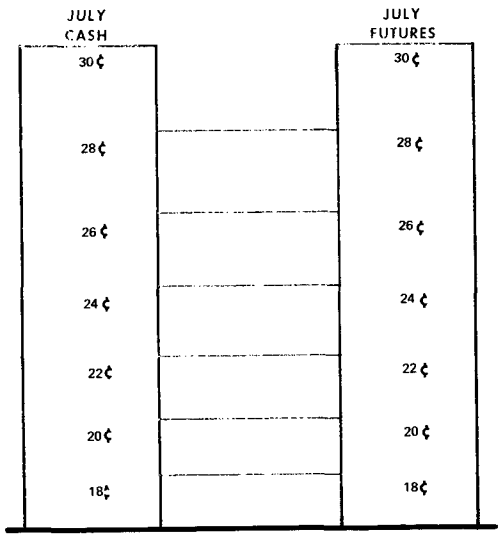

FIG. 4. Soybean oil price relationships, August-July (F.O.B. Decatur).

"High visibility" and "price discovery": The Board of Trade considers these their most important functions; prices both nearby and distant are highly publicized and help in the formation of production or consumption decisions. They're searching for the "right price" that will say "use it faster" or "slow it down" in terms of consumption rates, or "produce more" or "cut back" in terms of forward production. More on this later.

"How is Chicago soybean oil today?" is a global question. A Manila associate told me last week that this is the most common daily question he gets from even the most remote native copra collection stations – even before they find out that he is bidding for copra!

"Price discovery" has another implication – actual forces are entering the oil market and are being weighed and measured far earlier than they may be recognizable by even the best students of trading.

These four terms are far from a complete listing, but note Figure 4 for a glimpse of how the soybean oil "futures market" (with another new term "basis trading") operates. This is the so-called sophisticated trading system, but it's really only a two-step operation.

The first of these parallel bars can be the cash price of any forward-shipment oil contract; in this case July shipment oil from a particular soybean crusher, and on specified dates in July.

The second bar represents a "futures" contract as traded on the Board of Trade. It also represents a claim to a tank-car of soybean oil to be shipped to any buyer at *any time during* the month of July and from *any* crushing plant located over a wide area. It is therefore not used heavily for actual delivery because a consuming refinery can't plan where to send his tankcars or when oil will arrive at his plant.

Now let's take a glimpse of what happens as "soybean oil" prices advance or decline during the six to twelve months of active trading. Observe that the moves up and down are closely parallel as indicated by the horizontal lines.

Therefore, if I buy cash oil and sell futures contracts, I will gain roughly as much on one as I lose on the other; or conversely, I will lose on one by roughly the same amount as I gain on the other.

Now I can say I'm "hedged" or that I have used "risk transfer." In rough terms I have probably transferred 95 to

98% of price risk to the Board of Trade. Most of the dealer markets now also "cross hedge" other cash oils in soybean oil futures.

If I am a crusher, I am now much better equipped to find an oil buyer whenever I can buy soybeans at a suitable margin below soybean oil and meal values combined. I can buy the soybeans and sell oil and meal futures contracts to anybody on the Board of Trade. I have fairly well established the operating margin that is my primary goal. I still need to find a refiner willing to receive my physical cash oil on an orderly schedule. (Likewise I must find somebody who will use my protein meal.)

It's much easier to make a cash sale to a refiner-buyer if he doesn't have to reach his *final* pricing decision when I want to reach mine. He, too, wants to arrange an orderly shipping schedule with trustworthy suppliers.

Crusher and refiner end up negotiating a "basis contract" which stipulates time and place of shipment, and a cash premium or discount *relative to the July futures contract.* (The "basis" relationship always refers to the futures contract simply because it is much more "*visible*" and is much more *actively traded.*)

If the crusher is not speculating, his true return for this cash oil sale is fully determined whenever he has completed his basis sale. It is merely the sum of his (short) futures sale price plus his basis premium (or discount).

The buyer fixes his *true* cost whenever he buys a futures contract simply by adding this price and the basis premium (discount). Neither buyer nor seller is necessarily concerned with the other's *true* price.

The cash *billing* price at time of shipment represents *neither* the *true* revenue to the seller nor the *true* cost to the buyer because the basis premium is added to the transfer price which could be at almost any level.

While buyer pays cash to his seller at the "billing price," residual cash balances in buyer's futures account adjust his "billing cost" to his "true cost." Likewise residual cash balances in seller's futures account will adjust the "billing price" to his "true sales price" from the "two-step" transaction.

You can do arithmetic examples all night with variations in transfer prices – results will be the same (or prove your arithmetic has errors in it).

CHANGES IN THE "BASIS"

Earlier I indicated that perhaps 95-98% of price volatility is represented by the similar movements in cash and futures market prices. The "basis," since it must be haggled over and negotiated, obviously does vary to some degree. Limits (other than freight differentials) may range from "minus 100 points (1cent) to the July futures" to "plus 200 points (2 cents) to the July." Many trades are much closer to "even the July."

If you will visualize a triangle above the parallel line on the price chart, this is termed a premium market with cash at a premium to the futures. (If a nearby futures month is at a premium to subsequent futures months, this is termed an "inverted" market. An Englishman would term it a "contangled" market.) Such markets typically indicate strong demand. The forward positions lag primarily because not everybody will trade a position until forced to do so, even though forward prices are quite likely to rise later. (The speculator sees to it that forward prices don't lag too much.)

Symptoms of draggy demand occur when cash is at a discount to the futures or nearby futures are at a discount to forward futures (a "carrying charge market"). These are often signals that oil is being forced into storage for later use.

Summary of trading systems utilizing futures markets:

1. Traders are present in large numbers and trading volume is high ("fluidity" or "liquidity").
2. It is easier for a producer to agree on a cash trade with a consumer – most of the pricing problem is "against" the Board of Trade rather than "against" the other party to the cash trade ("basis trading").
3. Chains are shorter; risk of bankruptcy losses greatly lessened.
4. "Risk" (particularly for a processor) can be mostly transferred to the Board of Trade generally – speculators assuming the major share in hope of major reward.
5. Prices are highly visible – "price discovery" helps identify new forces and shape patterns of consumption and forward production.
6. Cash and futures prices for any single shipment period move in very similar degrees, rising cash premiums often signal strong demand (oil moving out of storage). The same is true of "inverted" markets in which nearby contracts are high or gaining on forward contracts.

ECONOMIC FUNCTIONS OF CHANGING PRICES

Any oil has both its unique characteristics and its collective similarities to other oils. Market pricing for each one, therefore, reflects both the uniqueness of that particular oil and the collective interchangeability that creates "the oils market complex."

Vegetable oils prices change rapidly and very sharply to adjust consumption to existing supplies and to create the most rapid adjustment possible in present marketings and forward production. Doublings are not unknown, nor is halving of prices.

Prices respond to supply, to demand, to monetary policies, to wars, to weather, to strikes, and to a myriad of other forces. They are also frequently hamstrung to some degree by well-intentioned but contraproductive governmental actions. Interferences may take the form of export or import duties (or taxes), quotas, embargos, "administered prices," or production controls.

Oil in a free market and selling at depressed prices stimulates consumption and curtails forward production. Conversely, oil at high prices conserves supplies by curtailing consumption and stimulates increases in forward production.

"State" restraints on prices seriously delay these essential adjustments, and a temporarily "contented" consumer wonders later why there isn't much left to buy in the current season and why prices eventually leap at some future point.

A final thought: Oil markets virtually ensure no long term surpluses or shortages. Most long range studies err in assuming that indicated annual surpluses during the early part of the period will be additive – inferring mounting surpluses. But comes a price change or a weather change and all surpluses disappear while projections begin again from "square zero." ●