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EMERGENCY ENERGY PROGRAM FOR
EASTERN AND CENTRAL EUROPE

Improving Oil Purchasing on Spot and Futures Markets

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Presented by:
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U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

Emergency Energy Program for Eastern and Central Europe
Component #3

Improving Oil Purchasing on Spot and Futures Markets

SEMINAR AGENDA

Day 1 – Morning

Overview/Current Oil Market Structure (M. Annesley)

- Development of the free market for oil

Introduction to Oil Futures Markets and Price Risk Management (R. Wedepohl, NYMEX)

- Role in the current market – what they are & why they are used
- Basic applications: hedging, speculation, arbitrage

Cash Oil Markets (M. Annesley)

- Brent, WTI, Dubai
- Regional product markets

Price Formation/Reporting (M. Annesley)

- Brief overview

Day 1 – Afternoon

Cash/Futures Contracting Applications (R. Poats)

- Detailed applications: EFPs, fixed price bids, netback pricing for crude, trigger pricing
- Hedging and Trading Examples

Mechanics of Trading (M. Annesley and R. Poats)

- Tendering
- Shipping
- Forward markets
- Costing
- Crude oil pricing and prices

Implementation Issues (M. Annesley and R. Poats)

- Trading principles

Day 2 -- Morning

Implementation Issues (continued)

Basis Risk Management (R. Poats)

- What it is and how to manage it

Technical Analysis Systems (R. Poats)

- Theory and limitations

Day 2 -- Afternoon

Exchange Options and Swaps/Derivatives (R. Poats and M. Annesley)

- What they are and how to use them; popular uses in Europe

How to Use Derivatives to Lock-In Refinery Margins (M. Annesley)

Day 3 -- Morning

Crack Spread Trading System (R. Poats)

- Using futures & options to manage refinery margins

Supply Optimization and Refining Margins (M. Annesley)

Role of the Refinery in Crude Oil Purchasing (C. Boudrye)

Day 3 -- Afternoon

Refinery Economics (C. Boudrye)

Product Supply (C. Boudrye)

Make or buy decisions

BACKGROUND ON PARTICIPATING SPEAKERS

Ms. Meg Annesley is a freelance consultant, specializing in oil trading, energy futures and derivative markets. She has advised the International Petroleum Exchange and the First National Bank of Chicago on developments in the Brent markets and has undertaken a variety of consultancy assignments concerning oil prices, hedging and market functioning. She has lectured for several years on oil trading matters at the College of Petroleum Studies at Oxford. Until December 1985 Mr. annesley was Managing Director of Tricentrol Oil trading Ltd., joining Tricentrol at the time their North Sea production commenced. In 1978, she established and managed an international trading operation based in London and Houston (USA) which traded in crude oil, products, and futures. She was with Tricentrol for 8 years. Prior to that Ms. Annesley spent 8 years with British Petroleum in International Supply and trading activities, followed by 3 years with independent oil trading and broking companies.

Mr. John Banks is a Senior Associate at International Resources Group where he specializes in economic and political analysis of oil and product markets in developing and Eastern/Central European countries. His expertise covers energy pricing regimes and policies, supply & demand analysis, as well as consumption and production patterns. Mr. Banks currently serves as Project Manager for two components of USAID's Emergency Energy Program in Eastern and Central Europe. His overseas field experience includes work in Bulgaria, Hungary, Poland, Romania, and Pakistan.

Mr. Charles Boudrye is a Senior Oil and Gas Consultant with International Resources Group who has over 30 years experience managing, designing, and applying mathematical computer-based modeling systems for oil and gas applications. He has considerable experience in linear programming, petroleum systems engineering, modeling for energy process flow, financial systems, microcomputer utilization, and systems design. For IRG, Mr. Boudrye has recently conducted training seminars in Poland, Hungary, the Czech and Slovak Federal Republic and Romania in refinery optimization, with a focus on the role of computer models and systems (linear programs). As a result of this work, he is familiar with numerous refinery operations throughout the region.

Mr. Rutherford Poats is a Senior Energy Specialist at International Resources Group where he concentrates on oil and gas market analysis, fuel procurement and risk management techniques. Mr. Poats has more than ten years of experience in developing and applying the energy futures and option markets. As a consultant to the New York Mercantile Exchange he helped develop the contract specifications for the crude oil and gasoline contracts. He has consulted with and created hedging strategies for a number of refiners, traders, producers, end-users and marketers of petroleum and natural gas. Mr. Poats also has extensive consulting experience in the public sector, including assistance to the U.S. Departments of Energy, Interior and Defense in contractual and analytic matters related to the oil markets. He has written and spoken extensively on oil market fundamental, technical and policy issues.

Mr. Rick Wedepohl is Marketing Analyst, Crude Oil for NYMEX. Before joining NYMEX in 1991, Mr. Wedepohl spent ten years working at various oil companies, Apex/Clark Oil & Refining, Center Oil Company, and Keller Oil Company, gaining experience in all areas of the cash market, including supply and distribution, refinery operations, wholesale and retail marketing, as well as pipeline trading. Mr. Wedepohl is a graduate of Loyola University of Chicago.

Section 1

Introductory Material

INTRODUCTORY INFORMATION

1. BASIC CONVERSION TABLES

(a) US gallons (USG) to 1 barrel = 42 USG/bbl.

(b) The number of barrels to a metric ton will depend upon the specific gravity of the crude or product.

Approximations:

PRODUCTS	bbls/mt
Motor Gasolines	8.6
Naphtha	0.9
Jet/Kero	7.9
Gas Oil	7.5
Low Sulphur Fuel Oil (less than 1%)	6.6
High Sulphur Fuel Oil	6.4
CRUDE OIL	
Iranian Light	7.4
Bonny Light	7.5

2. QUALITY

Defines the material which is being traded in terms of individual specifications.

All specifications must be met for a product to be on-grade.

Specifications describe:

Nature of the material	- e.g.	Distillation and Specific Gravity.
Purity of the material	- e.g.	Sulphur, Water, Sediment.
Required handling conditions	- e.g.	Flash Point, Pour Point, Viscosity, BTU's.
Performance in equipment	- e.g.	Octane, Diesel index.

(a) CRUDE OIL

Described in terms of:

Country of origin/name of Field or Load Port/
API Gravity
Sulphur

(b) PRODUCTS

Motor Gasolines	-	Otane, Vapour Pressure, Lead, Sulphur, Boiling Range.
Naphtha	-	Gravity, Boiling Range, Sulphur, N & A, Metals.
Jet Fuel	-	Freezing Point, Corrosion, Flash Point, Many Others.
Gas Oil	-	Gravity, Sulphur, Flash Point, Pour/Cloud, Cetane.
Fuel Oils	-	Gravity, Sulphur, Viscosity, Metals.

3. PRICING AND PRICE REPORTING

(a) PRICE REPORTS

PLATTS AND ARGUS: Daily Telex Service which quotes product and crude assessments worldwide and quotes actual deals done.

REUTERS AND TELERATE: Electronic Screen Services.

- Real time futures prices.
- Worldwide prince assessments update during day.

(b) PRICES

CRUDE OIL: - All quoted in &/barrel.

PRODUCTS:

Mediterranean North West Europe	- All $/metric ton.
New York (USEC) US Gulf Coast	- Fuel Oil $/bbl, others c/US gallon.
Singapore	- Fuel Oil $/mt, others $/bbl.
Arab Gulf Japan	- Naphtha & Fuel Oil $/mt, others.

GLOSSARY OF TERMS USED IN TRADING[1]

Account Executive (F,O) The agent of a commission house who serves customers/traders by entering their commodity futures and options orders, reporting trade executions, advising on trading strategies, etc.

Actuals (F,O) Physical cash commodities as opposed to futures commodities.

Additive (P) Chemicals blended in small amounts into gasoline and other products to improve quality.

ADP (F) Alternative Delivery Procedure. A futures contract provision which allows buyers and sellers to make and take delivery under terms or conditions which differ from those prescribed in the futures contract. An ADP may occur following termination of futures trading in the spot month, and after long and short futures positions have been matched for the purpose of delivery.

AFRA (P,F) Average Freight Rate Assessment is the weighted average of the Charter Market levels of all tankers actually trading during a particular month and is expressed in points of Worldscale, for each AFRA category of vessel. AFRA is published by the London Tanker Brokers Panel.

Alkylate (P) The high octane product from the alkylation process.

Alkylation (P) A refining process that combines isobutane with propylene or butylene in the presence of either sulfuric or hydrofluoric acid to produce alkylate with high octane that is blended in motor gasoline.

American Option (O) An option contract that may be exercised at any time prior to expiration. This differs from a "European option", which may only be exercised on the expiration date. NYMEX options are "American".

API (P) American Petroleum Institute.

API Gravity (P) Gravity (weight per unit volume) of oils as measured by the API scale whereby: API Gravity = (141.5/specific gravity at 60°F)-131.5.

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1 Key:
B - term used in physical forward markets, such as Brent, Dubai
F - term mainly used in Futures trading
O - term mainly used in Options trading
P - term mainly used in Physical Oil Markets
T - term mainly used in Freight, Tanker Markets

ARA (P,F) Amsterdam/Rotterdam/Antwerp range i.e. if a cargo offered C&F ARA the trade would understand that ports within this range could be considered. The freight element however would be applied to the actual port of discharge.

Arbitrage (F,O) The simultaneous purchase and sale of similar or identical commodities in two different markets.

Aromatics (P) Hydrocarbons such as benzene, toluene, and xylene (BTX).

Assign (F,O) To designate an option writer for fulfillment of his obligation to sell a futures contract (call option writer) or buy a futures contract (put option writer).

ASTM (P) American Society for Testing Materials. Grade and quality specifications for petroleum products are determined by ASTM in test methods.

Atmospheric Crude Oil Distillation (P) The refining process of separating crude oil components at atmospheric pressure by heating to temperatures of 600 to 750 degrees Fahrenheit and the subsequent condensation of the components at different temperatures by cooling.

At the Market (F,O) An order placed at the market is executed immediately at the best price available on the trading floor.

At the Money (O) An option is at the money when the underlying futures price equals the strike price.

Back-to-Back (P,B) A back-to-back arrangement is where a trader buys a cargo in the knowledge that he has a specific buyer or outlet for the cargo. Provided -- as is the usual case -- that the terms of the purchase covering areas of risk such as product quality, outturn discrepancies, demurrage, force majeure, etc., are the same for both the purchase and the sale, the trading risk is small. Essentially a back-to-back deal is an arrangement closed by a trader acting as a middle man which gives him a margin of profit with very little financial risk.

Backwardation (F,B) Market situation in which prices are progressively lower in the distant delivery months. An "inverted market".

Ballasting/Deballasting (P,F) Ballasting commences as soon as possible after completion of discharge and final draining. Involves taking ballast (water) into either separate segregated tanks (in the case of vessels with permanent ballast systems) and/or into cargo tanks, to assist vessels maneuverability. Deballasting is the operation of discharging the unwanted water (Ballast) from the vessel in order to free tanks to receive cargo.

Barge (P,T) An oil-carrying vessel, either motorized or towed, employed to carry products in rivers or lakes. Barges are smaller than ocean-going tankers, usually ranging in size from 8,000 to 50,000 barrels.

Barrel (F,O,P,T) A volumetric unit of measure for crude oil and petroleum products. Equivalent to 42 U.S. gasoline and 159 Liters.

Barrels Per Calendar Day (B/CD) (P) The maximum number of barrels of input processed in 24 hours after allowing for the following limitations:

> The capability of downstream facilities to absorb the output of crude oil processing facilities; The types and grades of crude oils and unfinished oils processed; The types and grades of products; The environmental constraints for the refinery operations; The reduction of capability for scheduled downtime for routine inspection, mechanical problems maintenance, repairs, and turnaround; The reduction of capacity for unscheduled downtime caused by mechanical problems, repairs, and slowdowns.

Barrels per Stream Day (P) The amount a unit can process running at full capacity under the best of conditions.

Basis (F,B) The differential that exists at any time between the futures, or toward price for a given commodity and the comparable cash or spot price for the commodity.

Batch (P) A measured amount of oil in a pipeline.

Batching Sequence (P) The order in which product shipments are sent through a pipeline.

B/D (P) Barrels per Day. Usually used to quantify a refiner's output capacity or an oilfield's rate of flow.

Bear (F,P) One who anticipates a price decline.

Bear Spread (O) An option position comprised of long and short options of the same type, either calls or puts, designed to be profitable in a declining market. An option with a lower strike price is sold and one with a higher strike price is bought.

Bid (F,O,P,B) A motion to buy a cash, toward futures or a option contract at a specified price.

Black Oils (P) A term used to describe collectively, heavy gasoil, diesel oil and fuel oil.

Blending (P) The mixing of various components to obtain a product of required properties.

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Blending Stock (P) Any of the stocks used to make commercial gasoline. The include natural gasoline straight-run gasoline, cat-cracked gasoline, pygas, alkylate and aromatics.

Book Transfer (P) Transfer of tile of a cash commodity to the buyers without a corresponding physical movement.

Bordeaux/Hamburg Range (P,T) A general term used to describe any likely discharge port within that geographical spread i.e. Bordeaux in the South and Hamburg in the North.

Box Spread (O) An option market arbitrage in which both a bull spread and a bear spread are established for a riskless profit. One spread includes put options and the other includes calls.

Break (F) A sudden decline in future prices.

Broker Futures (F) The person who executes the buy and sell orders of a customer in return for a commission or fee.

Broker - Physical (P,B) A broker in the international oil business is a person (or company) who seeks to bring two parties together to close a piece of business. Usually, the broker is paid by the seller and is thus legally the seller's agent, but in certain circumstances the broker may be paid by the buyer.

Broker - Tanker (T) A Tanker broker is a person (or company) who seeks to bring two parties together to close a charter party. Usually the broker is paid by the shipowner. An address commission is sometimes paid by the broker to the charterer.

BS&W (P) Bottom sediment and water, often found in crude oil and residual fuel.

Bulge (F) A rapid advance in futures prices.

Bull (F) One who anticipates a price increase.

Bull Spread (O) An option position composed of both long and short options of the same type, either calls or puts, designed to be profitable in a rising market. An option with a lower strike price is bought and one with a higher strike price is sold.

Bunker Fuel Oil (P) Heavy fuel oil used in ships' boilers.

Butane (P) A gas under normal temperature and pressure that is extracted from natural gas or refinery streams. It include both isobutane and normal butane.

Isobutane - A branch chain paraffinic hydrocarbon that boils at 10.9 degrees F.

Normal Butane - A straight chain paraffinic hydrocarbon that boils at 31.1 degrees F.

Butterfly Spread (O) A complex options position involving a minimum of four positions.

Buy Back Oil (P) Where an original equity holder has given up (for recompense) to the Government shareholding rights in a producing company, it sometimes retains, as part of the deal, the right to buy back some of the government's share. Such rights have generally been eroded, and replaced by straight purchase arrangements.

Calendar Spread (O) An option strategy involving the purchase and sale of two option contracts of the same type that have the same strike prices but different expiration date. Also known as a horizontal spread.

Call Option (O) An option which gives the buyer/holder the right to enter into a long futures position as a predetermined strike price, and obligates the seller/writer to enter into a short futures position at that designated prices, should the option be exercised.

Cargo Heating (P,T) Due do the density or "viscosity" of certain types of hydro-carbons, e.g. Tia Juana Pesado crude oil, most bitumens etc., have to be kept at a high temperature to avoid solidifying. When this type of oil is carried by ship it has to be loaded onto a vessel with cargo heating capabilities i.e. hollow coils, heated by steam from the ship boilers, and situated inside the cargo tanks.

Carrying Charge (P,F) The total cost of a storing a physical commodity over a period of time. Includes storage charges, insurance, interest, and opportunity costs.

Cash or Physical Commodity (P,F) The actual, physical commodity.

Cash or Physical Market (P,F) The market for a cash commodity where the actual physical product is traded.

Catalytic Cracking (F) The refining process of breaking down or "cracking" large, heavy hydrocarbon molecules into simpler and lighter molecules which are then blended to gasoline. Catalytic Cracking is accomplished by using a catalyst at high temperatures and pressure and is an effective process for increasing the yield of gasoline from crude oil gas oil streams.

Catalytic Hydrocracking (P) A refining process that uses catalysts in the presence of hydrogen at low temperatures and high pressures to convert distillates, gas oils, and residual oils to high octane gasoline blend stocks, reformer feeds, jet fuel and/or low sulfur fuel oil The process uses one or more catalysts, depending on product output desired and can process high sulfur feeds without prior desulfurization.

Catalytic Hydrotreating (P) A refining process for treating hydrocarbon streams from atmospheric or vacuum distillation units (i.e. naphtha, distillates, reformer feeds, heavy gas oil, residual oil) in the presence of hydrogen and catalysts. Hydrotreating includes desulfurization, removal of nitrogen, conversion of olefins to paraffins, and other processes that improve the quality of refinery streams

Catalytic Reforming (P) A refining process using catalysts under heat and pressure to rearrange paraffinic and naphthenic molecules into aromatic compounds, e.g. benzene, toluene, xylene, used for gasoline blending and petrochemical manufacture.

Ceilings (P) In terms of the importation of mineral oil products, a ceiling is a quantitative limitation in tons below which mineral oil products can be imported duty free. In principle the import duty may be re-imposed when these ceilings are exceeded. Ceilings are applied to the general system of preference (GSP) offered by the EEC to the developing countries. It should be noted that within the ceiling system the duty can be re-imposed from on day to the next, without a period of grace. This means that if a shipment of products purchased EEC Qualified and shipped just before the date of re-imposing and arrives after that day, the importer/buyer has to pay the import duty -- (unless otherwise agreed between both parties.

Certificate of Origin (P) Within the framework of customs provisions (e.g. preferential duty treatment) a certificate as evidence of the fact that the product was produced in the country of exportation. This certificate, provided it is duly endorsed by a nominated authority (e.g. Chamber of Commerce, Customs) in the country of exportation, entitles the importer to gain preferential duties, which often means zero rates in the country of importation. This certificate can also be required by the importing country for other reasons, e.g. foreign exchange purposed or implementation of quantitative restrictions. It should be noted that in accordance with "INCOTERMS 1980" the seller is not supposed to supply the certificate spontaneously but only at the request of the buyer. The term EEC Qualified covers that obligatory supply of the certificate of origin by the seller.

C&F (P,T) Cost Insurance and Freight - It is the responsibility of the seller to arrange for the cargo of oil to be delivered and discharged and the port nominated by the buyer. Marine insurance and freight costs are for the sellers account.

CFTC (F,O) Commodity Futures Trading Commission. The federal regulatory body which overseas commodity futures trading activities, standards and practices.

Charter Party (T) The contract between shipowners Owners and Charterers laying out the agreed terms and conditions of the ships' employment by Charterers.

CIF (F,T) Cost, Insurance, Freight. Term refers to a sale in which the buyer agrees to pay a unit price that includes the free on board (FOB) value at the port of origin plus all costs of insurance and transportation.

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COA (T) Contract of Affreightment. This form of contract is used where the owner of a cargo has a need to transport a quantity of oil over a given period but has no tanker tonnage of his own. Therefore he contracts with a ship owner to provide tanker tonnage to ship the oil in agreed parcel sizes at specified dates.

Commission (P,F,T,O,B) The fee charged by a broker for the execution of an order, contract, or charter party.

Commission House (F,O) An organization which trades commodities and/or futures and options contracts for customer accounts in return for a fee.

Commitment or Open Interest (F,O) The number of contracts in existence at any time which have not as yet been satisfied by an offsetting sale or purchase, by actual contract delivery, or, in the case of options, by exercises.

Compulsory Stocks (P) Stocks held by oil companies under government direction for strategic purposes.

Components (P) Unfinished product used to mix with other components and/or product/feedstock(s) to produce a material with particular properties.

Contango Market (F,B) A market situation in which prices are progressively higher in the succeeding delivery months than in the nearest delivery month.

Contract Grade (F) That grade of product established in the rules of a commodity futures exchange as being suitable for delivery against a future contract.

Cover (F,O,P,B) To close out a short futures foward, physical or option position.

Crude Oil (P) A mixture of hydrocarbons that exists in liquid phase in underground reservoirs and remains a liquid at atmospheric pressure after passing through surface separating facilities.

Day Trade (F,O,P,B) The purchase and sale of a futures, foward option or physical contract on the same day.

Deadfreight (T) Is the amount of cargo carrying space <u>not</u> utilized over a specific voyage by a charterer.

Delivery (F,P,B) The satisfaction of a futures forward a physical contract through the tendering and receipt of the actual physical commodity.

Delivery Month (F,P,B) The month specified in a given contract for delivery of the physical commodity.

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Delivery Notice (F) A notice presented through an exchange's clearing house by a clearing member advising of the intention to delive. the commodity in satisfaction of a contract cbligation.

Delivery Points (F,P,B) Those locations designed by an exchange or in a forward or physical contract at which delivery may be made in fulfillment of contract terms.

Delivery Sale (P) Unless otherwise agreed in the sales contract, buyer takes risk and property in the goods when they pass the vessel's permanent hose connection at the receiving installation. Seller therefore is responsible for all costs and bears the risk of loss or damage until delivery takes place. There is a danger that this mode of selling could be interpreted by local authorities that the seller is trading in the country of delivery and consequently would be liable to local taxation.

Delta (O) The amount of which an option premium changes relative to a change in the price of the underlying futures contract. Deltas are positive for bullish option positions and negative for bearish option positions. Deltas of deep-in-the-money options are equal to one; deltas of at-the-money options are around 0.5; and deltas of deep out-of-the-money options are zero. Delta is an instantaneous rate of change and varies by a factor "gamma" with respect to the underlying futures price.

Demurrage (T) The penalty paid by Charterers or cargo suppliers/receivers for delaying a ship at a port of loading or discharge. Demurrage, payable at a predetermined rate, is charged for that period of time that the used laytime exceeds the permitted laytime.

Diesel Fuel (P) Distillate fuel oil used in compression-ignition engines.

Dirty Cargo (P) Those petroleum products which leave significant amounts of reside in tanks. Generally applies to crude oil and residual fuel.

Distillate Fuel Oil (P) Products of refinery distillation sometimes referred to as middle distillates, i.e., kerosene, diesel fuel, and home heating oil.

Downstream (P) The commercial petroleum operations beyond the crude production phase, i.e., refining and marketing.

Downstream Processing (P) The refining of crude oil into petroleum products, usually under a contract with a third party.

EEC Import Duty (P) Duty on petroleum products imported from non-EEC countries is levied as a means of providing revenue for the European Community. The present Common Customs Tariff (CCT) is fixed at 6% for high/medium oils and 3.5% for heavy oils. While this may be taken as the general rule, there are however a number of

exceptions, e.g. in the field of international aid to developing countries where the EEC has granted freedom of import duty by a combination of quotas and/or reduced duty levels on products which originate from developing countries. It should be noted that this duty system only applied to finished products as feedstocks destined for certain specified processes in refineries or chemical plants can be imported duty free.

EEC Qualified (P) A current term in purchase and sale arrangements which means that the consignment in question is subject to preferential EEC duty treatment in the country of destination. This treatment can only be claimed if a certificate of origin is produced to the customs of the importing country. Preferential duty treatment can only be claimed for products originating in those countries that are parties to agreements/arrangements with the EEC in which the latter has granted preferential treatment on imports into its territory. This treatment applies to products from virtually all countries, with the exception of the USA, Japan, Australia, New Zealand, USSR, and East European countries (excluding Rumania and Yugoslavia).

EFP (F) Exchange of Futures for Physicals. A futures contract provision involving the delivery of physical product (which dies not necessarily conform to contract specifications in all terms) from one market participant to another and a concomitant assumption of equal and opposite futures positions by the same participants.

Ethanol (P) Ethyl alcohol, made from a variety of materials such as grain, potatoes, sugar, timber, and wastes. In the United States, most ethanol is made from corn. A mixture of 10 percent ethanol and 90 percent gasoline is called "gasohol".

End User (P) A company or organization which buys or acquires hydrocarbons, either crude oil or products, for its own consumption and not for re-sale. Thus, a refining company is an end-user of crude oil as a feedstock and an electricity company would be an end-user of fuel oil as feedstock.

Equity Oil (P) Oil obtained by an oil company by virtue of its shareholding in the producing company (or equivalent) as opposed to more or less straight purchase. The acquisition cost of equity crude comprises production costs, plus tax and royalty payments to the producing country government.

Escalation Clause (P) Clause that established how a basic agreed price shall actually be applied to a sale due to differences in: (a) quality e.g. gravity variation; (b) hostgovernment take.

European Option (O) An option which may be exercised only on its expiration date.

Exercise (O) The right granted to the option's holder to buy the underlying futures contract, in the case of a call option, or sell the underlying futures contract, in the case of a put option.

Exercise Price (O) The price at which an option may be exercised. Also called a "strike price".

Expiration Date (O) The last day an option may be exercised.

Ex Ship (P,T) Ex Ship means that the Seller shall make the goods available to the Buyer on board the ship at the port(s) of discharge, as named in the sales contract. The Seller usually had to bear the full cost and risk involved in bringing the goods there.

Extrinsic Value (O) An option's extrinsic value is the amount by which the premium exceeds its intrinsic value. Also known as time value.

Feedstock (P) Hydrocarbons which can be used as the basic material fed into a refinery or manufacturing process (primary or secondary unit). For example, although the normal feedstock for a distilling unit is crude oil some residues (generally mixed with crude) can constitute a feedstock for distilling. - Vacuum gas oil and heavy distillate from a vacuum distillation constitute a feedstock for a catalytic (or hydro) cracking unit. - Heavy naphtha is the normal feedstock of a catalytic reforming unit.

Fence (O) An options position combining a long and short position, one put and one call (or vice versa) at two different strike prices.

F.I.P. (P) "Free in Pipeline". Delivery of oil into a transportation pipeline. Risk and property remain with the seller until the oil is delivered into the buyer's pipeline.

First Notice Day (F) The first day on which delivery notices on futures transactions may be delivered and authorized to an exchange.

F.O.B./F.O.R./F.O.T P,B) Free on Board. The seller is responsible for placing on board the buyer's ship the goods as per the contract. Risk of loss or damage to the goods is transferred from the seller to the buyer asthe goods pass the ship's sail, at port of loading, unless otherwise agreed in the contractual terms. These terms are synonymous, since the word 'truck' relates to the railway wagons. They should only be used when the goods are to be carried by rail. Free on rail and free on truck.

Fractionation (P) The process whereby saturated hydrocarbons from natural gas are separated into distinct parts ("fractions") of propane, butane, ethane, etc.

Fungible (P,F) Interchangeable. Products which can be commingled for purposes of shipment or storage, or which are interchangeable under a trading contract.

Futures (F) Standardized contract for the purchase or sale of a commodity which is traded for future delivery under the provisions of exchange regulations.

Forward (B) Standardized contract for the purchase or sale of a commodity which is traded for future delivery, not under the provisions of an exchange.

Gas Freeing (T) Operation to remove all potential dangerous, i.e. combustible gases from cargo tanks to minimize the risk of fire and/or explosion.

Usually achieved by pumping inert gas into the tanks thereby creating a non-inflammable atmosphere.

Gasoline Blending Components Naphthas (P) Naphthas that will be used for blending into finished motor gasoline. Includes straight-run gasoline, alkylates, and reformats.

Gasohol (P) A blend of finished gasoline (leaded or unleaded) and alcohol, limited to 10 percent by volume alcohol.

Gasoline, Raw (P) The untreated gasoline that is cut from the distillation of crude oil.

Gasoline, Straight-run (P) The gasoline-range fraction that is distilled from crude oil.

G.S.P. (P) "Government Selling Price". The price at which a Producing Government (or Government Company) announces as its GSP. It will not necessarily actually sell at this price to anyone (apart, possibly, from favored Lesser Developed Countries). Practice varies widely from country to country -- some sell most at their GSP, some sell most as GSP plus a considerable premium. Some smaller countries sell all their oil on a more-or-less open market. Their selling prices although determined by a Government, are not generally included in list of GSPs.

Harbour Steaming (T) Commences on arrival off the normal Sea Pilot's boarding area (or other agreed point) and ends when mooring commences. Harbour steaming outwards is the same in reverse. The time required for this operation depends primarily on the safe navigation of the ship for which the Master alone is responsible.

Heating Oil (P) No 2 Fuel Oil, a distillate fuel oil used either for domestic heating or in moderate capacity commercial-industrial burners.

Heavy Crude (P) Crude oil with a high specific gravity and a low API gravity due to the presence of a high proportion of heavy hydrocarbon fractions.

Hedge Ratio (O) The ratio, determined by the option's delta, of futures to options required to establish a riskless position. For example, if a $1/barrel change in the underlying futures price leads to a $0.25/barrel change in the option premium, the hedge ratio is 4 (four options for each futures contract).

Hedging (F,P) Generally, two positions that are considered opposite risk. In futures, a simultaneous initiation of equal and opposite positions in the cash and futures markets. Hedging is employed as a form of financial protection against adverse price movement in the cash market.

H.G.T. (P) Literally -- the (general US$) amount (per barrel) received by a Host Government by way of royalty and taxes etc.

In trading, originally "plus HGT" meant that the basic price would increase by the same among as the Host Government Take increased between date of offer and date of completion of loading.

However, while in a few cases the above may still apply, in general, these days "(plus) HGT" means that the basic price shall increase by any increase in the GSP, and any other taxes between the dates of offer and loading.

I.E.A. (P) International Energy Agency - The IEA was set up in November 1974 as an autonomous body within the O.E.C.D.

The four main objectives are:

(a) To reduce excessive dependence on oil through energy conservation, development of alternative energy sources and energy research and development.

(b) To develop an information system on the international oil market.

(c) To encourage rational management and use of world energy resources.

(d) To prepare a plan against risk of major disruption of oil supplies and to share available oil in the event of an emergency

Import Parity (P) (1) The price set for an indigenous crude or product by adding together:

(a) The f.o.b. price of the nearest readily available competitive material adjusted for quality and location;

(b) The appropriate freight and insurance;

(c) Allowance for "ocean loss";

(d) Import duties.

(2) The price set for sundry crude or product available for disposal at "X" by deducting from the sum of 1), a) and b) above, at a main consuming point, the freight and insurance from "X" to that main consuming point.

Indication/Offer/Acceptance (P,B) Three distinct phases in a negotiating dialogue.

An Indication is a verbal or written advice by a prospective seller to a customer that he may have goods or commodities for sale in approximate terms.

An Offer is a notification by the offeror that he is willing to do business on particular terms and that the notification by turned into a binding agreement through acceptance by the offeree. Nothing short of an unequivocal acceptance turns an offer into a binding agreement.

Acceptance of an offer finally closes the transaction and is thus legally bonding on both parties. However, it should emphasized that a "counter-offer" is in practice a rejection of the formal offer and the offering party is therefore quite entitled to withdraw from the dialogue if he wishes. It is also important to remember that when accepting an offer subject to certain terms being finalized, that this is not a complete acceptance, and therefore the whole deal is not legally binding.

In the Money (P) An option is in the money if the underlying futures price is above a call option's strike price, or below a put option's strike price.

Independent (P) Term generally applies to a non-integrated oil company, usually active in only one or two sectors of the industry. An independent marketer buys product from major or independent refiners and resells it under its own brand name. There are also independents which are active either refining or crude production exclusively.

Intrinsic Value (O) An option's intrinsic value is equivalent to its in-the-money valuation.

Isomerization (P) A refining process that alters the arrangement of atoms in the molecule without adding or removing anything from the original material. Used to convert normal butane into isobutane, a feedstock to alkylation, and normal pentane and hexane into isopentane and isohexane which are high octane gasoline blending components.

Japanese Trading House (P) This is a term used to describe one of the many large and influential Japanese companies who, although based in Japan operate on a worldwide basis. These 'Houses' originated as family concerns specializing in the commodity market where they maintained control over all aspects of business from banking and finance through to manufacturing and marketing. Recently they have expanded into "oil" bringing with them an entrepreneurial approach to trading. The power of these 'Houses' can be measured by the fact that almost every commodity imported or exported would be routed through a Trading House e.g. Mitsubishi, Marubeni, C. Itoh.

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Jet Fuel (P) Kerosene-type; quality kerosene product used primarily as fuel for commercial turbojet and turboprop aircraft engines.

Jobber (P) A middleman, buying from refiner, taking into account all costs from production or purchase to the refinery.

Landed Price (P) The actual delivered cost of oil to a refiner, taking into account all costs from production or purchase to the refinery.

Last Trading Day (F,O,B) The final day for a particular delivery month futures, forward or option contract. Any futures contracts left open following this session must be settled by delivery.

Laycan (T) Shortened for "Laydays Canceling". The dates between which the shipowner must present his vessel for loading. Failure to do so gives charterer the right to cancel or re-negotiate terms of charter, see laydays.

Layday (P,T) The range of dates in which a vessel must present itself for loading.

Allowed Laytime (P,T) The period of time allowed contractually for Charterers or cargo suppliers/receivers to physically load and or discharge the cargo. The contract must specify whether they are calendar days (running days) or working days etc. Laytime commences traditionally when notice is tendered by the Master of the ship's readiness to load or discharge (irrespective of whether a berth is available or not), or contractually 6 hours after tendering, or 6 hours after tendering or berthing, whichever is the earlier, or contractually 6 hours after tendering or on commencement loading/discharge whichever is the earlier.

Lead (P) Tetraetgyl lead (TEL) is a chemical compound added to gasoline to help prevent "knocking" in an engine due to uncontrolled burning of the gasoline.

Lifting (P) Refers to tankers and barges loading cargoes of petroleum at a terminal or transhipment point.

Light Crude (P) Crude oil with a low specific gravity and high API gravity due to the presence of a high proportion of light hydrocarbon fractions.

Lights Ends (P) The more volatile products of petroleum refining, e.g., butane, propane, gasoline.

Limit (F) The maximum amount a futures price may advance or decline in any one day's trading session, as determined by the exchange.

Limit Order (F,O) A contingent order for an option or futures trade specifying a certain maximum (or minimum) price, beyond which order is not to be executed.

Liquidation (F,O) The closing out of futures and options positions.

Liquidity (F,O,B) A market is said to be "liquid" when it has a high level of trading activity.

Liquified Petroleum Gases (L.P.G) (P) Propane, butane, or propane-butane mixtures derived from crude oil refining of natural gas fractionation. For convenience of transportation, these gases are liquified through pressurization.

Long Position (F,O,B) In the futures market, the position of a contract buyer whose purchase obligates him to accept delivery unless he liquidates his contract with an offsetting sale. In the options market, position of the buyer of a call or put option contract. In the forward market a long position obligates a buyer to accept delivery unless a book-out agreement is subsequently agreed upon.

Lot (F) Any definite quantity of a futures commodity of uniform grade; the standard unit of trading.

Major (P) A term broadly applied to those multinational oil companies which by virtue of size, age, and/or degree of integration, are among the pre-eminent companies in the international petroleum industry.

Margin (F,O) Funds or good faith deposits posted during the trading life of a futures contract to guarantee fulfillment of contract obligations. Margins are also required on <u>short</u> options positions. Not usually required in forward markets.

Martin Call (F,O) A demand for additional margin funds when futures or options prices move adverse to a trader's position. Not usual in forward markets.

Maximum Price Fluctuation (F,O) A commodity exchange's standardized maximum limits for fluctuations in futures prices or options premium during any one trading session.

Mercaptans (P) Methyl alcohol made from natural gas, coal, and many other organic substances. Improves gasoline octane.

Middle Distillate (P) Hydrocarbons that are in the so-called "middle range" of refinery distillation. Examples are heating oil, diesel fuels and kerosene.

Minimum Price Fluctuation (F,O) Minimum unit by which a futures price or an option premium can fluctuate per trade.

MMT (P) Methylcyclopentadienyl Manganese Tricarbonyl, an octane boosting additive used in leaded gasoline.

Mogas (P) Industry abbreviation for motor gasoline.

Motor Gasoline (Finished) (P) A complex mixture of volatile hydrocarbons blended for use in spark-ignition engines.

Finished Leaded Gasoline - Contains more than 0.05 grams of lead per gallon or more than 0.005 grams of phosphorous per gallon.

Finished Unleaded Gasoline - Contains not more than 0.05 grams of lead per gallon or not more than 0.005 grams of phosphorous per gallon.

Motor Oil (P) Refined lubricating oil usually containing additives, used in internal combustion engines.

MTBE (P) Methyl Tertiary Butyl Ether. An oxygenate used to improve gasoline octane numbers.

Naked Option (O) Short option position taken without having an offsetting position in the futures market.

Naphtha (P) A volatile, colorless product of petroleum distillation. Used primarily as a paint solvent, cleaning fluid, and blendstock in gasoline production.

Naphthenes One of the three basic hydrocarbon classifications found naturally in crude oil. Naphthenes are widely used as petrochemical feedstocks.

Natural Gas Liquids (N.G.L.) (P) A general term for all liquid products separated from crude oil or natural gas at the wellhead. N.G.L. includes propane, butane, ethane, condensate, and natural gasoline.

Netback (P) Industry term referring to the net FOB cost of product offered on a delivered or CIF basis. It is derived by subtracting all costs of shipment from the landed price.

Net position (F,P,B) The difference between the open long contracts and the open short contracts in any one commodity.

N.O.R. (T) Notice of Readiness is the time and date a ship presents when ready in all respects to load or discharge cargo.

Octane Number (P) A measure of gasoline's ability to burn without abnormal knocking. The main measure of octane numbers is an average of Research Octane Number (RON) and Motor Octane Number (MON) expressed as (RON + MON)/2.

Offer (P,F,O,B) A motion to sell a futures forward physical or option contract at a specified price.

Offset (F,O,B) A transaction which liquidates or closes out an open contract position.

OPEC (P) The acronym for the Organization of Petroleum Exporting Countries, that have organized for the purpose of negotiating with oil companies and others on matters of oil production, prices, and future concession rights. Current members are Algeria, Ecuador, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela.

Open Interest or Commitment (F,O) The number of contracts in existence at any period of time which have not as yet been satisfied by an offsetting sale or purchase; by actual contract delivery, or in the case of options, by exercise.

Open Order (F,O) A resting order that is good until canceled.

Open Price (F,O) The price for a given futures commodity that is generated by trading through open outcry at the opening of trading on a commodity exchange.

Operable Capacity (P) The component of operable refining capacity that is in operation at a given time.

Original Margin (F) The initial deposit of funds, as good faith monies, at the outset of trading a futures contract in order to guarantee fulfillment of its obligations.

Out of the Money (O) An option that has no intrinsic value. For example, a put option is out of the money if its strike price is below the underlying futures price.

Outturn Quantity (P,T) Is the actual quantity of oil discharged by the ship and received in shore tanks always varies from the loaded quantity. This figure is used to analyze whether a claim should be made against the shipper for short delivery of cargo.

Oxygenates (P) Oxygenates include both alcohols and ethers used as octane boosting additives.

Par or Basic Grade (F) The grade or grades specified in a given futures contract for delivery. A contract may permit substitutions for and deviations from the par grade subject to specified premiums or discounts.

Paraffin (P) A series of saturated hydrocarbons including methane, ethane, propane, and butane.

Petrochemical (P) An intermediate chemical derived from petroleum, hydrocarbon liquids or natural gas, e.g., ethylene, propylene, benzene, toluene, and xylene.

Petroleum (P) A generic name for hydrocarbons, including crude oil, natural gas liquids, refined and product derivatives.

Phantom Offer (P) A so-called offer normally brought to an oil company by an entrepreneur, middleman or influence peddlar with no previous experience or knowledge of the oil industry. The term phantom (also called "flake") gained currently in 1973/1974 during the oil crisis. Phantom operators generally exist by persuading companies to issue a letter which they can then use as evidence that he is acting as a buyer on their behalf.

Pipeline (P) A pipe through which petroleum is pumped between two points, either offshore or on-shore.

Platt's (P) Long established petroleum journal which provides news, marker information and prices. It also publishes 'MARKETSCAN' a daily information telex quoting product prices in major markets. These are accepted as an effective 'marker' by the industry.

Point or Tick (F,O) The smallest monetary unit of change in a futures price or an option premium.

Port Loading One/Two (P,T) On occasions due to factors of cargo availability or logistics etc. it becomes necessary to load, or reserve the right to load, only a part of a cargo at one port and to complete the cargo loading operation at a second port.

Position (F,O,B) One's status, as long or short, in the market

Position Taking (P,B,F,O) Taking a position is to close a firm contract to buy crude oil or products, or to secure capacity such as refining or shipping. By definition, to take a position implies a forward commitment where the buyer accepts all the risks without regard to the possible upward or downward development of the market during the period that the business is being discharged. When a trader takes a position it normally suggests that he has acquired a commitment to take title to product, crude oil, futures etc. probably on a speculative basis, without a fixed outlet, in the hope that the market will rise and he will make a profit.

Posted Price (International) (P) The price quoted by a selling company as the price at which it would normally offer a product for bulk sale subject to availability.

Posted Price (USA) (P) The price some oil purchasers will pay for crude of a certain API gravity from a particular field or area.

Premium (O) The price of an option determined buyers and sellers in open, competitive trading on the exchange trading floor.

Prompt Barrel (P) Product which will move or become available within three to four days.

Propane (P) A natural hydrocarbon occurring in a gaseous state under normal atmospheric pressure and temperature, however, propane is usually liquified through pressurization for

transportation and storage. Propane is primarily used for rural heating and cooking and as a fuel gas in areas not serviced by natural gas mains and as a petrochemical feed stock.

Put Option (O) An option that gives the buyer/holder the right to enter into a short futures position at a predetermined strike price and obligates the seller/writer to a long futures position should the option be exercised.

Quality Giveaway (P) The selling price of any given product will reflect quality characteristics, e.g. a low sulphur fuel will command a higher selling price than a high sulphur fuel oil. Quality 'give away' occurs when a supplier is forced or chooses to provide, a customer with a product that is of better quality than that required, and for which appropriate compensation is not received or recoverable.

Rack Price (P) Price charged by a supplier to a customer that buys transport truck lots at a terminal, on an FOB basis.

Refiner Acquisition Cost (P) The cost of crude oil to the refiner, including transportation and fees.

Refiner's Fee (P) A refiner's fee is the price he charges for supplying refining capacity to his customer.

Refiner Marketer (P) A marketer of gasoline and/or heating oil who operates his own manufacturing plant (refinery).

Refinery (P) A plant used to separate the various components present in crude oil and convert them into end-use products or feedstocks for other manufacturing processes.

Refinery Capacity Utilization (P) The ratio of the total amount of crude oil, unfinished oils, and natural gas plant liquids processed by crude oil distillation units to the operable capacity of the units.

Refinery Yield (P) Refinery yield, expressed as a percentage, represents the amount of finished products produced from the input of crude oil and unfinished oils.

Reforming Process (P) The use of heat and catalysts to effect the rearrangement of certain hydrocarbon molecules without altering their composition appreciably; e.g. the conversion of low-octane stocks suitable for blending into finished gasoline.

Reid Vapor Pressure (RVP) (P) A measure of volatility of gasoline. The higher the vapor pressure, the more readily the gasoline will evaporate.

Residual Fuel Oil (P) Very heavy fuel oil produced from the residue in the fractional distillation process rather than from the distilled fractions.

Resting Order (F,O) An order for futures or options away from the market, waiting to be executed.

Rollover (F) A special futures trading procedure involving the shift of a position from one month for a straddle into another future month while maintaining the other contract month of the original straddle position. The shift can take place in either the long or short straddle month.

Rotterdam Market (P) Historically, the Rotterdam Market grew out of the complex of oil industry facilities (storage and refineries) which developed in the Dutch port of Rotterdam. By far the greater volume of products handled through the Rotterdam installations was mainstream business carried out by major companies. However, another market soon developed in Rotterdam for re-sellers and distributors, who wished to buy job lots of oil to put into their own small outlets. Most of this business was moved by barge. As is the case with any market, a business infrastructure -- comprising traders, brokers, price quotations ,etc. -- soon developed and this became known as the "Rotterdam Market." It should be emphasized that most of the activity was in products trading and very little crude was or still is traded actually in the port of Rotterdam.

By the mid 1970's, because of changes in the pattern of the international oil business, many of the small trading companies who had first established business in rotterdam moved their offices away from the City, mostly to London. The reason for this was two-fold; firstly, the market had become mostly a tanker market and secondly London offered far better communications with other parts of the world than Rotterdam. London is also a major money and marine market and the location of a number of major Company offices.

However, one should not be misled by the term "Rotterdam Market". Trading activity in the port of Rotterdam today is mostly confined either to barges or to the transfer of oil in tank. The reason the term "Rotterdam Market" is still used is a hang-over from the previous system where prices were quoted at Rotterdam. The Rotterdam quotation is essentially a guide to prices in North West Europe. It is perfectly possible to operate in the so called Rotterdam market from an office in Tokyo, if you have good telex and telephone communication facilities.

Roundturn (F) The completion of both a purchase and sale of a commodity futures contract.

SDW (P) Summer Deadweight. Deadweight assigned to the vessel on her summer marks and includes cargo, bunkers, stores and water.

Sell Short (P) Sell short is a term generally used by entrepreneurial traders in the physical _____ where they have taken a commitment to supply cargoes of crude or products to a buyer, fully contracted, but when they have not secured the back up supplies to meet this obligation.

Settlement or Settling Price (F) The most representative price prevailing in a given commodity futures contract near the close of daily trading. Settlement prices are used to determine margin calls and invoice prices for delivery.

Short Position (F,O,B) In the futures market, the position of seller whose sale obligates him to deliver the commodity unless he liquidates his contract by an offsetting purchase. In the options market, the position of the seller of a call or a put option. The short in the options market is obliged to take a futures position if he is assigned for exercise.

In the forward market a short position obligates a seller to deliver unless a book ut settlement is subsequently agreed upon.

Sour/Sweet Crude (P) Industry terms which denote the relative degree of a given crude's sulfur content. "Sour" crude refers to those crudes with a comparatively high sulfur (generally 1.5% wt. and above); and "Sweet" to the lower sulfur grades.

Specifications (P) Term referring to the properties of a given crude oil or refined petroleum product, which are "specified" since they often vary widely even within the same grade of product. In the normal process of negotiation, seller will guarantee buyer that the product or crude to be sold will meet certain specified limits. Generally, the major properties of oil that are guaranteed are API gravity; sulfur; pour point; viscosity and BS&W.

Specific Gravity (P) The ratio of the density of a substance at a particular temperature to the density of water at 4 C.

Speculator (F,O,B,P) An individual who invests in markets with the objective of achieving profits by successfully anticipating price movements.

Spot (P) Term which describes a one-time open market case transaction, where a commodity is purchases "on the spot" at current market rates. Spot transactions are in contrast to term sales, which specify a steady supply of product over a period of time.

Spot Month (F,P,B) The futures contract closest to maturity. The nearby delivery month.

Spot Price (F,P) A transaction price conclude "on the spot", that usually involves only one quantity of a product. In contrast, a term contract sale price usually obligates the seller to deliver a product quantity and price over a period of time. A price in physical trade for one delivery, usually a fixed price.

Spread (Futures) (F,B) The simultaneous purchase of one futures or forward contract and sale of a different futures or forward contract. Also refers to a futures/toward contract purchase in one market and a simultaneous sale of the same commodity in some other

market. May also refer to a futures or toward contract purchase in one month and the sale of the identical contract in another month.

Spread (Option) (O) The purchase and sale of two options of the same type (calls or puts) which vary in terms of strike prices, expiration dates, or both.

Stop-Loss (F) A resting order designed to close out a losing position when the price reaches a level specified in the order. It becomes an at-the-market order when the "stop" price is reached.

Straddle (Futures) (F,B) Also known as a spread, the purchase of one futures month against the sale of another futures month of the same commodity. A straddle trade is based on a price relationship between the two months.

Straddle (Options) (O) The purchase or sale of both a put and a call having the same strike price and expiration date. The buyer of a straddle benefits from increased volatility, and the seller benefits from a decline in volatility.

Straight-Run (P) Fractions produced directly from crude oil by hydro-skimming as against heated cracking or reforming. Refers to a petroleum product produced by the primary distillation of crude oil; the simple vaporization and condensation of a petroleum fraction, without the subsequent use of temperature, pressure, solvents, additives or catalysts.

Straight-Run Gasoline (P) A hydrocarbon stream produced by crude oil distillation that usually has a low octane number.

Strangle (Options) (O) Similar to straddles, only at different strike prices (usually at our-of-the-money prices).

Strike Price (O) The price at which an option may be exercised. Also called an exercise price.

Sulfur (P) An element that is present in some oil and gas an impurity in the form of its various compounds.

Tank Train (P) A procedure in the rail shipment of crude oil, refined products, and other liquids developed by General American Transportation (GATX). "Tank Train" tank cars are interconnected, which permits loading and unloading of the entire train of cars from one trackside connection.

Tariff (P) A schedule of rates or charges permitted a common carrier or utility; pipeline tariffs are the charges made by common carrier pipelines for transporting crude oil or products from an origin to a destination.

Technical Analysis (F,B) Examination of patterns of futures price change, rates of change, and change in trading volume and open interest, often by charting in order to predict and profit from such trends.

Thermal Cracking (P) A refining process in which heat and pressure are used to crack, rearrange, or combine hydrocarbon molecules. Thermal cracking includes the processes of Visbreaking, Fluid coking, delayed coking, and Flexicoking.

Throughput (P) A term used to describe the total volume of raw materials that are processed by a plant such as an oil refinery in a given period. Also refers to the total volume of crude oil and refined products that are handled by a storage facility or pipeline.

Time Charter (T) The hiring of a vessel for an agreed period of time (usually minimum 3 months) with specific services on the ship provided by Owner, and normally with relatively unrestricted terms.

Title (P) To have title to oil is to have ownership fully supported by a legally documented and agreed terms of purchase and sale.

Trading Volume (F,O,B) The number of transactions in a contract made during a specified period of time.

Transhipment (T) The transfer of oil from tanker to one or more other tankers, whether by ship to ship or via shore lines.

Trend (F,O,B,P) The general direction of price movement.

Unfinished Oils (P) Includes all oils that require further processing in a refinery before they can be sold as finished products.

Upgrading (P) The physical process of "improving" or changing a poor quality product/feedstock into a better quality product.

Ullage (P,T) The amount (normally expressed in tons) of useable tankage space (either shore or ships tank) that is available at a given time in relation to receiving more hydrocarbon.

Viscosity (P) A method of measuring a given liquid's resistance to flow, usually decreasing with increasing temperatures.

Volatility (F,O,B) A statistical measure of dispersion of either historical or expected commodity price changes. It can be derived from the standard deviation of logged rates of return of these prices.

Voyage Charter (T) The hiring of a vessel at an agreed charter rate for one or more specific voyage(s) only i.e. restricted period and/or location.

Wet Barrel (P) An actual barrel of product already physically in storage at the time of a given transaction; as opposed to a "paper barrel" which appears only as a credit in an accountant's ledger.

Worldscale (T) "Worldscale" is the code name for the freight scale published by the Worldscale Association (London) Limited in conjunction with the Worldscale Association (NYC) Incorporated New York.

"Worldscale" is a list of basic freight rates for all voyages upon which tankers ply and is calculated according to a common set of assumptions to provide a yardstick which accurately reflects the relationship between one voyage and another. It gives a mean whereby rates for all voyages and market levels can be assessed and compared.

Section 2

The Development of the Free Market for Oil

THE DEVELOPMENT OF THE FREE MARKET FOR OIL

PRIOR 70's	-	MAJOR INTEGRATED CONTROLLED CRUDE OIL SOURCES AND PRODUCT MARKETS
	-	MAJORS COMMON AIMS
	-	OPEC - NO POWER
	-	NO TRADERS
	-	LITTLE/NO COMPETITION
	-	PRICES STABLE/RISING
1973	-	OPEC CONTROLS CRUDE OIL SUPPLY
	-	MAJORS LOSE CONTROL OF CRUDE OIL SUPPLY
	-	TRADERS PROLIFERATE
	-	SPOT MARKETS DEVELOP
	-	DEVELOPMENT OF COMPETITIVE PRESSURES ON MAJORS
1980's	-	OPEC 'MANAGEMENT' WEAK
	-	PRICES FALLING
	-	TRADERS/MAJORS NEEDED NEW TECHNIQUES (TO SHORT MARKET) (MANAGE RISKS)
	-	COMPETITIVE MARKET DEVELOPMENTS

EARLY 1980's	-	**NYMEX**
		IPE - GAS OIL } FUTURE MARKETS
		BRENT } FORWARD MARKET
	-	**TRANSPARENCY**
	-	**PRICE RISK MANAGEMENT**
1986	-	**CRUDE OIL PRICE CRASH**
	-	**HUGE PRICE RISKS**
	-	**INCENTIVE TO TRENDS FOR USE OF RISK MANAGEMENT TECHNIQUES**
LESSONS:	-	**OIL COMPANIES WERE SHELTERED FROM COMPETITION UNTIL 70's**
	-	**HAD TO ADAPT TO NEW ENVIRONMENT**
	-	**ADAPTED TO USING MARKETS AND THEIR TECHNIQUES**
	-	**SIMILAR TO EASTERN AND CENTRAL EUROPEAN INTEGRATION INTO 'FREE MARKET ECONOMY'**
	-	**OIL COMPANIES HAVE LESS THAN 20 YEARS LEAD TIME**
	-	**KEY TO PROSPERITY - ADAPTATION**

THE DEVELOPMENT OF THE FREE MARKET FOR OIL

PRIOR TO THE 70'S

Internationally, prior to the 70's both production and markets were essentially controlled by the 7 sisters. (Shell, BP, Exxon, Texaco, Mobil, Chevron and Gulf). The infrastructure for transporting, refining, distributing and sales was also largely owned or controlled by these companies, where foreign companies were permitted to operate. In 1970 BP estimated that more than half of the world's production was owned or controlled by the 7 sisters.

In the USA, there were a wider spread of independent producers and marketers, partly as a result of the anti-trust trials of 1911, splitting the dominant Standard oil into 33 individual companies, and partly as a result of the type of geology in the USA, encouraging exploration by small groups and even individuals. companies such as Hunt (Bunker Hunt's oil company) and Pennzoil grew from small independent producers, whilst others such as Marathon, Unoco, Phillips and Getty started life as the spun-off Standard oil companies. The relatively fragmented industry in the USA, of those days, resulted in a more competitive market than operated internationally, however the US was not integrated within the western markets due to various US import controls and taxes.

the production and marketing assets of the 7 sisters and their overall interests were very similar. There was a surplus of oil, expanding economic activity post war and the need to fuel this with regular and cheap supplies of oil. The infrastructure was gradually developed by the 7 sisters, who were only, at best, in quasi-competition with each other. More important was to develop the markets, provide a home for the oil surpluses and feed the economies of the west. Competition was curbed by the few participants and their parallel interests.

OPEC was not a recognizable force. BP's book of the oil industry published in 1970 only mentions OPEC twice, in passing, in 525 pages!

Equally the circumstances of the industry had not encouraged any trading participation in the international markets. The traders of today, like Phibro and Vitol were a product of the 70's, whilst the financial traders like Morgan Stanley and Goldman Sachs (J. Aron) did not arrive on the scene until the mid 80's.

1973

In 1973 various forces combined to give OPEC the chance to exert its latent power. Demand had caught up with production, the new supplies of Libya were being developed by a wider range of companies, breaking the old stranglehold of the 7 sisters and more vulnerable to the producers demands. Opec exerted its powers with a fourfold increase in price and a relatively swift take-over of the production interests of the 7 sisters and other peripheral producers such as CFP (Total) and Agip.

This set off a chain of events that changed the face of the oil industry. The 7 sisters lost control of production (outside the west) to the producers, and their OPEC cartel. Traders and independents started to see opportunities in the changed supply climate, particularly in channelling supplies from OPEC producers to the markets. This was the start of competitive pressures on the majors and opportunities for a much wider participation of outside interests

in oil. From independents exploring and producing oil to traders exploiting the fat profit margins of the majors.

Gradually, the spot market developed, during the years following the watershed of 1973. Traders proliferated, mainly small operators, staffed by ex-oil company personnel and backed by European banks, such as Parisbas. Meanwhile European and US governments were concerned to make clearer the financial returns of the oil companies, operating across international borders. Therefore pressure to make international pricing more transparent encouraged more open spot market dealings and the reporting of these deals. The price reporting services like Platt's and Petroleum Argus found a new and expanding niche.

During this period prices were relatively stable and profit margins were good, a legacy from the previous lack of competition in the oil markets. Majors and traders lived in relative harmony each enjoying profitable business, with little price volatility to contend with. Traders bought in the knowledge of good margins and little risk.

1979

Another watershed occurred in 1979, with a crippling increase in the oil prices by OPEC on the back of spot market increases in price as a market response to the revolution in Iran. The inadequate preparation by western governments to manage short term shortages created panic buying and hoarding.

1980's

The longer term effects are more pertinent to our current exploration of the development of the free markets for oil, and their place in the current market structures. The huge price increases of 1979 shifted power, wealth and prosperity from the west to the producing nations and led to a worldwide recession and more particularly to an emphasis on fuel saving and conservation. The recession and conservation shrank the requirements for oil, and made OPEC's task of sharing amongst its members the revenue generating production, far more difficult. OPEC's struggles were only partly effective as prices dropped consistently between 1981 and 1985, culminating in the large price falls of 1986.

During this period, it was the competitive market that drove prices lower as well a higher as surpluses and perceived shortages were anticipated by the oil companies and traders, alike. As OPEC struggled with over-capacity, and the management of its members with their tendency to over-produce and because there were no restrictive or effective cost barriers to overcome (the marginal cost of crude oil in the west, and the fully built-up cost of crude oil in the Middle East was as low as a dollar or two per barrel) crude oil and petroleum product prices rose and fell freely. This price volatility was exacerbated by the growing efficiency of price reporting - giving a measure of price transparency to market users - and the competitive pressures for profit performance.

By the 80's traders were well established, but were plagued with the risks of changeable prices. Price trends were quite extreme with maybe falls of $2-3/bbl over a few weeks being quite common. At the beginning of the decade there were no price management tools. The Brent standardized market, the Nymex and IPE gasoil were all introduced in the first few years of the 80's, as a response to the needs of the market participants to manage the risks of the by now volatile prices.

The trend to managing the risks of fluctuating prices, was aided by the introduction of the Exchange Futures markets and by the adaptation of contracts, like the Brent and russian gasoil contracts into standardized formats, making it as easy for traders and oil companies too sell and cover as it was to buy and then sell, the traditional form of trading activity. As the flexibility of the standardized contracts was gradually realized the volume of the markets grew, creating a liquid environment for managing the inherent risks of running an oil company, or indeed any organization, like traders, with oil price risks.

1986

In 1986 the oil markets suffered a major price crash, caused by a change to Saudi policies, a preponderance of netback sales amongst producers, and probably assisted by the then unstructured state of the free markets.

The huge price swings of that year, gave a huge boost to the un-developed risk management industry in oil. Oil companies and traders had managed price swings in the Brent market and to some extent in the futures markets, but in a limited way. But, now the price swings could not be ignored and needed increasingly to be managed. The futures markets prospered and even the Brent market which had suffered a major series of defaults in February 1986, soon recovered to attain greater prominence and volume.

An even more significant event with a more lasting effect was the entry to the markets of the financial risk managers. The 'Wall Street Refiners' as they were soon dubbed. They brought financial liquidity to the markets, their presence gave respectability and most importantly they brought the risk management techniques from the financial markets. To start with, the deals they offered were tailor-made to the specific price risks run by the oil companies and gave flexibility in purchase and sale contracts to companies who did not use the futures markets directly. Options and now fixed price swaps have followed. The market for these techniques is small as yet, but going fast.

LESSONS FROM THE DEVELOPMENT OF THE FREE MARKET FOR THE EAST AND CENTRAL EUROPEAN COUNTRIES

The change from a market controlled by the 7 sisters to the highly opportunistic circumstances of today has taken less than 20 years. Until the early 80's the oil companies and traders did not know of techniques for price risk management. These only arose from 1982 onwards, and the first of the "Wall Street Traders" (Morgan Stanley and J. Aron) entered the oil markets in 1985.

The wide use of futures and risk management tools is quite new and developing rapidly. The oil companies have had to change and adapt to this new environment. The parallel for the East and Central European oil companies and communities is to learn from the adaptation of the oil companies. They had to adapt to survive, and had to adapt fast, in a commercially competitive climate.

As the new European countries gradually integrate with the west and sever their oil dependency on the Soviet Union, they will need to adapt to operating in the competitive markets. It will be comfort for them to know how new the competitive markets are and how the risk management industry is even less established.

The western companies are only a few years ahead and with a little effort the new Europe can catch up and even overtake the west.

We are here to help that process!

M.I. Annesley

Market Structure

Trading Principles

- Mainly occurs in transport

  FOB
  C.I.F. (C and F)
  Delivered into tank
  in pipeline

  (see glossary for definitions - Section I)

- Relates to physical market structure

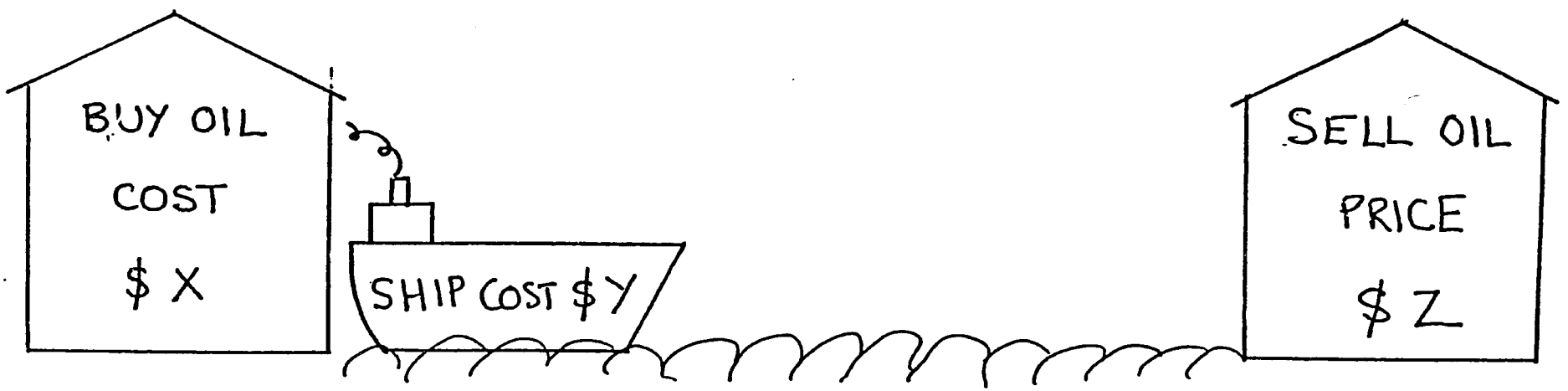
  e.g. F.O.B. production areas:

  Arab Gulf, North
  Sea, West Africa, etc.

C.I.F.	Consumption/Refinery area U.S. Gulf, Rolterdam U.S.E.C., Mediterrian Singapore, etc.

- Pricing needs to be economic to move to destination

  i.e. supplies <u>compete</u> for destinations



$X + Y < Z$ PROFIT

$X + Y > Z$ LOSS

TRADITIONAL TRADING

PHYSICAL MARKET

RISK MANAGEMENT

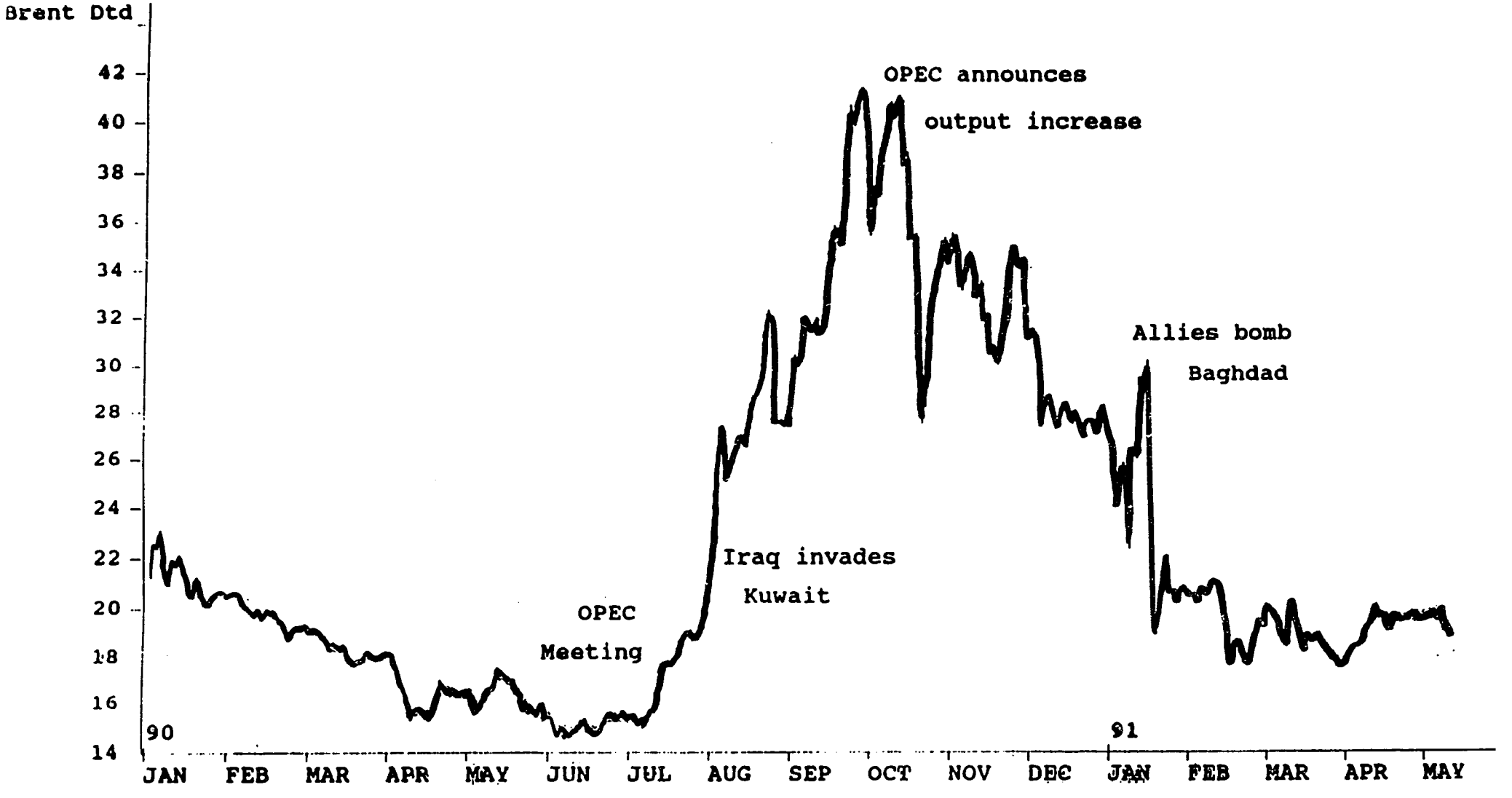
- FUTURES MARKETS
- FORWARD MARKETS
- OPTIONS MARKETS - EXCHANGE
  - OVER THE COUNTER
- ADVANCED PRICING - WALL ST. REFINER

Section 3

Introduction to Price Risk Management

Basic Applications

2/01/90 - 14/05/91



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WHY MANAGE PRICE RISK EXPOSURE

- VOLATILITY OF PRICES
- UNCERTAINTY OF PRICES
- DIVISION IN MANAGEMENT OF UPSTREAM AND DOWNSTREAM PROFITABILITY
- GLOBALIZATION OF THE MARKET
- COMPETITIVENESS

TYPES OF RISK

- CRUDE OIL INVENTORY RISK
- REFINED PRODUCTS INVENTORY
- REFINERY MARGIN
- FIXED PRICE PURCHASE OR SALES RISK
- Currency Risk
- Interest Rate Risk
- Fiscal Changes

OIL FUTURES EXCHANGE

DEFINITION

A FUTURES EXCHANGE IS AN ORGANISATION OWNED BY COMPANIES AND/OR INDIVIDUALS, INTERESTED IN PROMOTING THE USE OF THEIR EXCHANGES FOR THEIR OWN AND OTHERS TRADING.

REGULATED BY LAWS IN COUNTRY OF INCORPORATION

OBJECTIVE RULES FOR MEMBERSHIP

FINANCIAL CRITERIA FOR MEMBERSHIP

OIL FUTURES MARKET

DEFINITION

A FUTURES MARKET IS THE MARKET DESIGNED BY THE FUTURES EXCHANGE PROVIDING A CENTRALISED LOCATION FOR TRADING.

MARKETS ARE PROVIDED FOR RELEVANT GRADES TO BE TRADED, CALLED <u>CONTRACTS</u>.

SPECIFIC RULES ARE PROVIDED FOR EACH CONTRACT.

TRADES USUALLY CONDUCTED ON A <u>MARKET FLOOR</u>

MARKET FLOORS ARE MANNED [IN FUTURE ELECTRONIC?]

ALL TRADING DONE BY EXCHANGE MEMBERS

TRADING IS IN FUTURE MONTHS

OIL FUTURES EXCHANGE (WITH NOTES)

DEFINITION

A FUTURES EXCHANGE IS AN ORGANISATION OWNED BY COMPANIES AND/OR INDIVIDUALS, INTERESTED IN PROMOTING THE USE OF THEIR EXCHANGES FOR THEIR OWN AND OTHERS TRADING.

Typical members are Shearson, Man International, Morgan Stanley, Goldman Sachs, and (particularly in the US: locals). Exchanges provide lists of members.

REGULATED BY LAWS IN COUNTRY OF INCORPORATION

CFTC in US and AFBD in UK regulate the Exchanges, under specific laws governing 'investments', in UK for all financial instruments (Financial Services Act, 1986) and in the US for commodities (Commodities Exchange Act). In both the US and the UK, all futures contracts must b e traded on a regulated exchange.

OBJECTIVE RULES FOR MEMBERSHIP

- To be fair to both Exchange members and their customers.
- To provide a level playing field.
- To avoid arbitary exclusion of players.
- To ensure no anti-competitive practices are operated at the Exchange, etc.

FINANCIAL CRITERIA FOR MEMBERSHIP

- To ensure adequate performance of customers orders and general level of credibility of market.
- To avoid arbitary exclusions of interested members and that Exchange is not anti-competitive.

OIL FUTURES MARKET (WITH NOTES)

DEFINITION

A FUTURES MARKET IS THE MARKET DESIGNED BY THE FUTURES EXCHANGE PROVIDING A CENTRALIZED LOCATION FOR TRADING.

The centralized location concentrates activity and provides liquidity (many trades) enabling quick access to trading.

MARKETS ARE PROVIDED FOR RELEVANT GRADES TO BE TRADES, CALLED CONTRACTS.

The desire for Exchanges is to provide a range of contracts suitable for risk management, particularly in the area they serve. (i.e. Nymex in USA, and IPE in Europe)

SPECIFIC RULES ARE PROVIDED FOR EACH CONTRACT.

The rules are designed to be equally fair to buyers and selelrs. Although the processes of the Clearing House facilitate offsetting of contracts, contracts are designed to enable delivery to occur. This ensures the prices of the futures contracts converge with the spot physical market, when the futures contract close (cease trading). There is a specified time each day for trading. There is a specified period for trading each futures contract. Specific delivery periods are traded (called months, but delivery is not necessarily for the whole month).

TRADES USUALLY CONDUCTED ON A MARKET FLOOR

MARKET FLOORS ARE MANNED [IN FUTURE ELECTRONIC?]

Traders employed by the Exchange members congregate on the Exchange floor and execute orders for their customers (or themselves). Customer orders are given by telephone to the floor dealers, who buy and sell the Exhange contracts, by open-outcry, and at a price made public to the Exchange. It is not the Exchange that makes the price, it is the traders, dealing either for themselve or for their customers, who create the price by competitive bids. The Exchange reports the prices, through Reuters, Telerate and other electronic screen-based price-reporting services.

ALL TRADING DONE BY EXCHANGE MEMBERS

To trade direcly on Exchange you must be a member of the Exchange and are therefore subject to the Exchange rules. Other companies trade by becoming customers of the members of the Exchange. Customers have contracts with Exchange members and can have contracts with several Exchange members. Customers must have a contract with an Exchange member, which has to be negotiated, as do the fees for conducting futures business.

TRADING IS IN FUTURE MONTHS

The exchange will specify in its rules when trading commences in a futures contract, sometime up to ... months ahead, and when trading ceases. Cessation of trading, having considering the operational constraints of the delivery, is as close as practical to spot deliveries.

OIL FUTURES FEATURES

EXCHANGE:	RULES MANAGEMENT
STANDARD:	VOLUME/QUALITY/ QUANTITY/DELIVERY
FUTURE DELIVERY:	MONTHS

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OIL FUTURES CONTRACT

Definition

Is a standard contract for the sale or purchase of oil (standard - volume/ quantity and quality) traded for future delivery at specific locations in predetermined months under the rules of an exchange

NEW YORK MERCANTILE EXCHANGE FUTURES CONTRACTS

	Contract Details
Heating oil Unleaded gasoline	42,000 gallons Delivery NY harbour
Light, sweet crude - WTI	1,000 bbls delivery cushing, Oklahoma
Natural gas	10,000 mm btu delivery sabine pipeline Henry Hub, Louisiana

INTERNATIONAL PETROLEUM EXCHANGE FUTURES CONTRACTS

GASOIL.

VOLUME PER LOT	100 mt (basis SG = 0.845)
DELIVERY	FOB Rotterdam, Amsterdam, Antwerp into barge or coaster

NAPHTHA

VOLUME PER LOT	100 mt
DELIVERY	FOB Rotterdam/Amsterdam Antwerp

BRENT CRUDE OIL

VOLUME PER LOT	1000 bbls
DELIVERY	Cash Settlement

DUBAI CRUDE OIL

VOLUME PER LOT	1000 bbls
DELIVERY	Cash settlement

SINGAPORE INTERNATIONAL MONETARY EXCHANGE FUTURES CONTRACTS

Fuel Oil	Delivery FOB Singapore 100mt
Gasoil	Delivery FOB Singapore 100mt
Dubai Crude Oil	Cash Settlement 1000 bbls

OIL FORWARD CONTRACT

DEFINITION

IS A STANDARD CONTRACT FOR THE SALE OR PURCHASE OF OIL TRADED FOR FUTURE DELIVERY AT SPECIFIC LOCATIONS IN PRE-DETERMINED TIME PERIODS.

THE STANDARD CONTRACT IS SET BY THE OIL TRADE AND THE VOLUME/QUANTITY AND QUALITY CAN HAVE TOLERANCES REFLECTING THE PHYSICAL OIL MARKET.

THERE IS NO CLEARING MECHANISM.

REGULATION (CODE OF CONDUCT)

OPTIONS – DEFINITIONS

- An option is an agreement to make a deferred purchase or sale at a fixed price
- A call option is the right to buy
- A put option is the right to sell
- Buying a call option provides the right to buy the underlying asset/oil at a fixed price within a defined period
- Buying a put option provides the right to sell the underlying asset/oil at a fixed price within a defined period

EXCHANGE OPTIONS CONTRACTS

NYMEX

- WTI CRUDE OIL
- HEATING OIL
- UNLEADED GASOLINE

IPE

- BRENT CRUDE OIL
- GAS OIL

OPTIONS TRADING

Buy put	-	Right to sell
Sell put	-	Obligation to buy
Buy call	-	Right to buy
Sell call	-	Obligation to sell

Section 3

Hedging and Other Basic Risk Management Techniques

HEDGING

Definition

Hedging is taking an equal and opposite position on a futures market to that on the physical market to protect against major adverse price changes

WHY SHOULD ENDUSERS HEDGE?

- TO LOCK IN A MARGIN OVER A KNOWN COST.

- TO EXERCISE CONTROL OVER WINDFALL PROFITS AND LOSSES.

- TO PROVIDE GREATER FLEXIBILITY IN BUSINESS PLANNING.

- TO PROVIDE INSURANCE AGAINST DISASTER

PERFECT HEDGE

In theory perfect hedges do exist, in practice they NEVER do. There are a number of reasons:

1. Design of future contract. e.g. specification, lot size
2. Timing of delivery
3. Geographical considerations
4. Technical factors such as 'squeeze' on spot month

EXAMPLE: GASOIL SUPPLIER

(SHORT HEDGE)

20th OCTOBER 1991	**Futures**	**Physical**
Futures, sold, Jan IPE at	$224.00 mt	
(At that time gasoil trading at $220.00 net delivered * Rotterdam in barges for prompt delivery)		
1st DECEMBER 1991		
Futures, bought Jan at	$197.00 mt	
Physical material sold		$193.00 mt
Futures profit	$27.00 mt	
Effective selling price		$220.00 mt*

The cost of trading would be broker's commission and financing of deposits and margins. These would have a small effect on the effective selling price

MANAGING THE HEDGE

Close relationship with futures broker who must know what you are doing or about to do on physicals so he can advise on optimum time for closing out futures positions

TRADING THE HEDGE

Trading the hedge means that you change the futures side of the position, which results in not having an equal and opposite position to the physical commodity and, by definition, results in not being hedged properly or completely

A close relationship with the broker is essential if the risk inherent by 'lifting a leg' (i.e. changing one side of the hedge) is to be acceptable

OTHER HEDGES

Comparing unlike with unlike (apples and oranges) for example:

Jet versus gasoil

Naphtha versus unleaded gasoline

Marine diesel or bunker fuel versus gasoil or even crude

SPREAD TRADING

HEDGING - PROTECTING POSITIONS - IMPLICIT

ALMOST ALL HEDGES ARE IMPERFECT

- LOCATION
- TIMING
- QUALITY

HEDGE A CARGO OF JET IN NWE

- IPE GASOIL
- RUSSIAN GASOIL
- OPEN SPEC NAPHTHA
- NYMEX HEATING OIL
- NYMEX GASOLINE

DECISION INVOLVES UNDERSTANDING THE SPREADS BETWEEN THE AVAILABLE HEDGING TOOLS AND BETWEEN THEM AND JET IN NWE

EXAMPLE: KEROSINE USER

(LONG HEDGE)

7th AUGUST 1991	**Futures**	**Physical**
Futures, bought, Jan IPE at	$186.00 mt	
(Kerosine valued at $20.00 over gasoil. Kerosine valued at $206.00)*		
1st DECEMBER 1988		
Futures, sold Jan at	$197.00 mt	
Physical material bought at		$217 mt
Futures profit	$11.00 mt	
Effective buying price		$206 mt*

The cost of trading would be broker's commission and financing of deposits and margins. These would have a small effect on the effective buying price

ADVANTAGES OF HEDGING

- Reduction of adverse absolute price risk
- Greater stability and flexibility in business planning
- Easier financing
- Separation of price and distribution/ supply risks

DISADVANTAGES OF HEDGING

- Basis Risk
- Limit Moves
- Incompatibility of Cash + Futures

SPREAD TRADING

DIRECT SPECULATION IN SPREADS - EXPLICIT

REASONS

WINTER/SUMMER SEASONAL DIFFERENTIALS

OUT OF LINE BASED ON HISTORY

MOVING FROM BACKWARDATION TO CONTANGO

SPREAD TRADING

Trading the differential between different but related material in the same or different markets by making simultaneous purchases and sales

EXAMPLES

NYMEX	-	Heating Oil	v.	Gasoline
	-	WTI	v.	Heating Oil
	-	WTI	v.	Gasoline
IPE	-	June Gasoil	v.	August Gasoil

ARBITRAGE

Trading the differential between the same, or very similar, material in different markets by simultaneous purchases and sales

EXAMPLES

NYMEX Heating Oil	v.	IPE Gas Oil
NYMEX WTI Crude Oil	v.	IPE Brent Crude Oil

BROKER

1. Buys/sells in his, the broker's name gives client anonymity

2. Big brokers are clearing members of the exchange - which means they hold the contracts on behalf of the clients

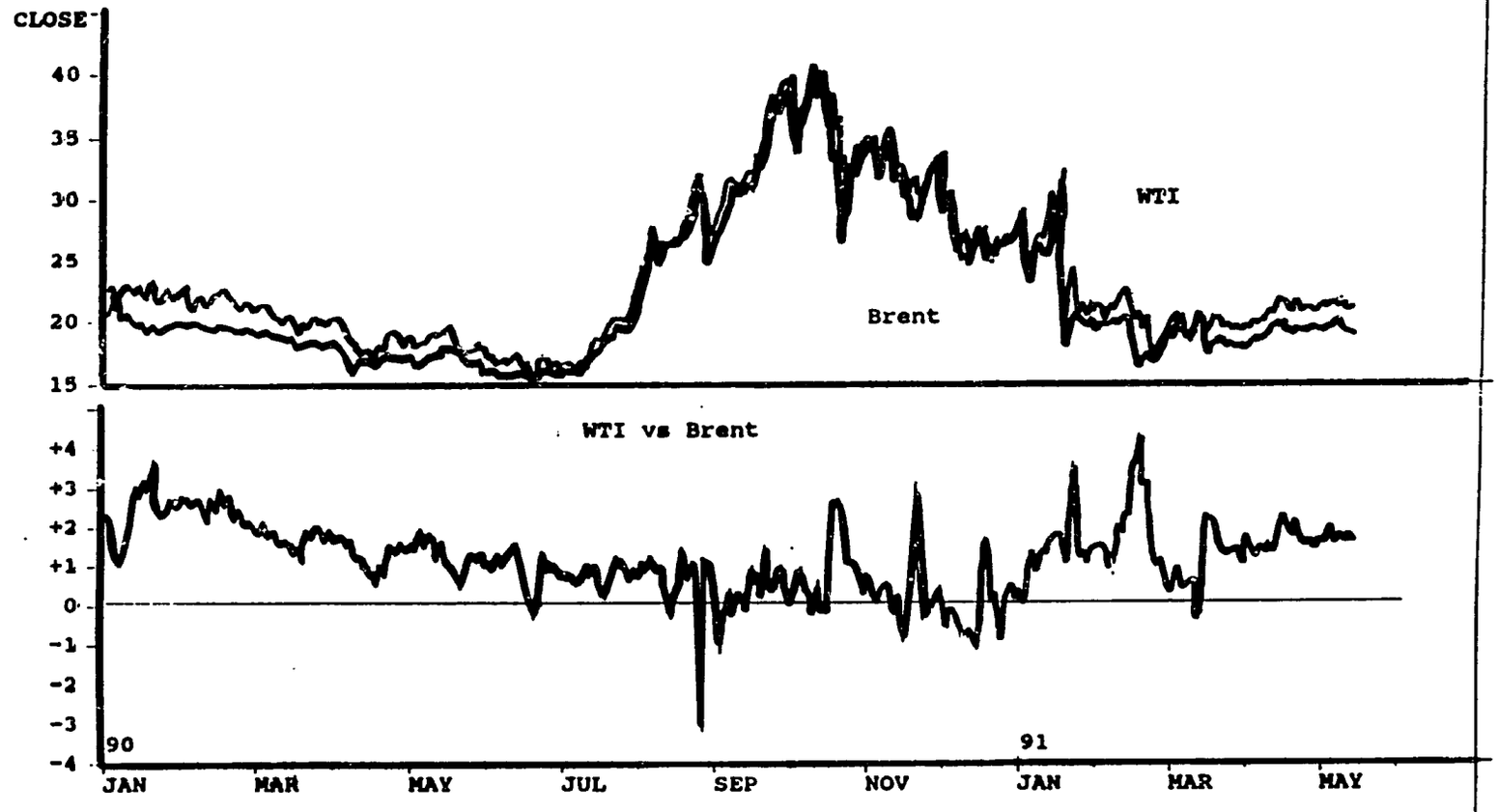
3. There has to be a long term contract between client and broker (clearing member)

REUTER BENCHMARK

BRENT IPE / WTI NYMEX - Futures Prices

17/05/9

2/01/90 - 4/06/91



WTI NTMEX Close ($/BBL)
Brent IPE Close ($/BBL)

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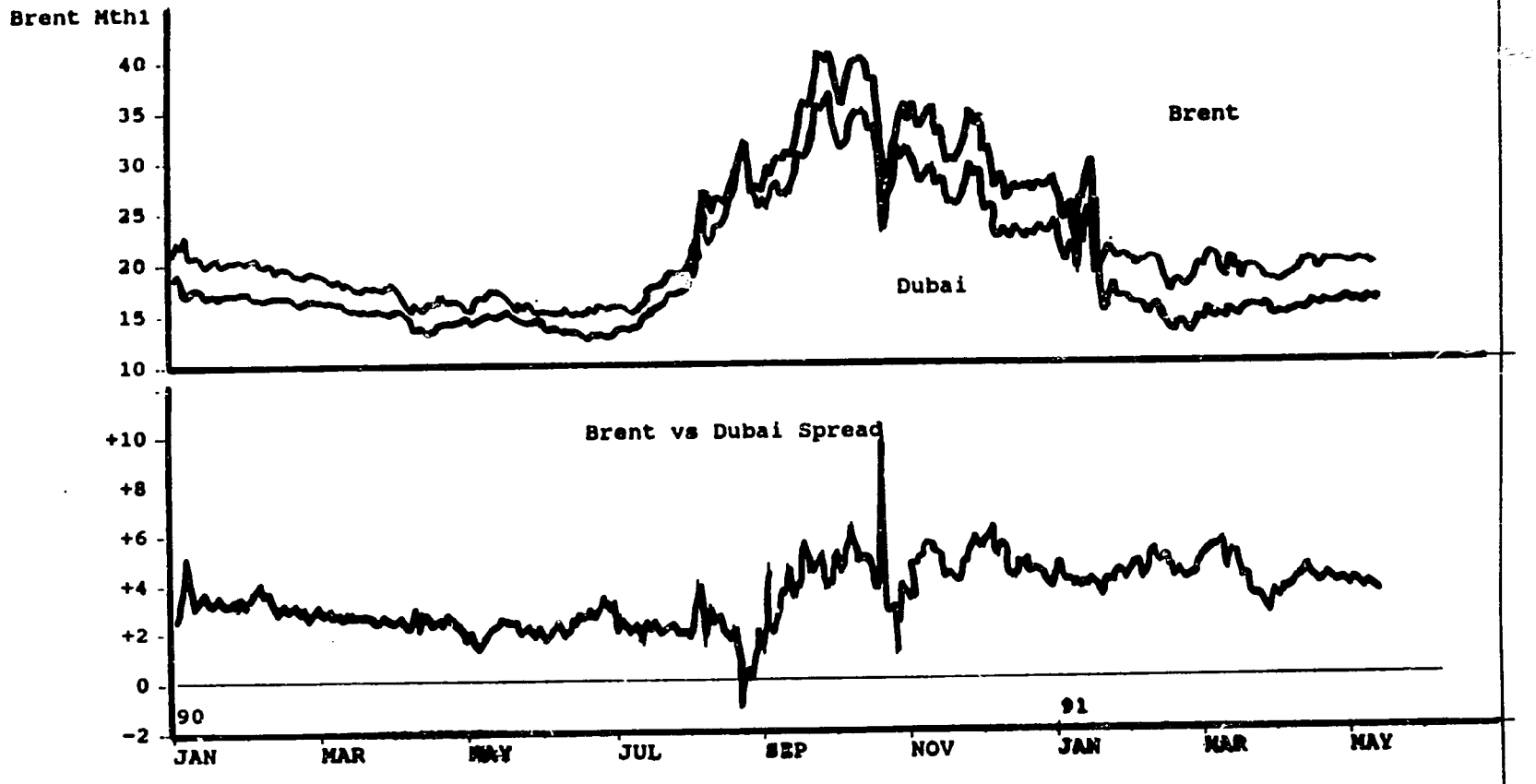
REUTER BENCHMARK

SPOT PRICES

16/05/9

2/01/90 - 10/06/91



Brent Mth 1
Dubai Mth 1

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3 WAYS OF TAKING/MAKING DELIVERY

1. Standard delivery procedure
   - buyers/sellers matched by clearing house

2. ADP : Alternate delivery procedure

3. EFP : Exchange of futures for physicals

DELIVERY
IPE
Gasoil FOB Amsterdam, Rotterdam or Antwerp

Trading ceases in the spot month 3 working days before 13th

Delivery will take place between 15th and last day of the month

Seller to advise location, buyer to nominate date range for lifting. Seller can reject date range but must accept alternative.

Vessel nomination:
48 hours before arrival

Payment:
5 Days after loading via ICCH

FEP and ADP permitted

DELIVERY
NYMEX
Heating Oil and
Unleaded Gasoline Contracts

FOB sellers ex-shore facility in New York harbour into barge, truck, pipeline, by stock transfer and by pumpover. Trading in current month stops on the last working day of the month preceeding the delivery month.

Delivery must be initiated after the 5th working day and completed before the last working day of the delivery month.

EFPs and ADP permitted

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BASIS RISK ON SHORT HEDGE

	PHYSICAL MARKET $ ton	FUTURES MARKET $ ton	BASIS $ ton
BOUGHT JET	125.00 mt		
SOLD IPE gasoil		+110	-15
SOLD JET	+115.00		
BOUGHT IPE gasoil		-100	-15
NET	-10.00	+10.00	0

(This was a PERFECT HEDGE)

BOUGHT JET	-125.00		
SOLD IPE gasoil		+110.00	-15
SOLD JET	+115.00		
BOUGHT IPE gasoil		-102.00	
NET	-10.00		

QUESTION: was this a PERFECT HEDGE?
: what change occurred in the BASIS?

COSTS

1. Initial margin
   or
   Original margin
   or
   Deposit

   } Paid immediately set by the Clearing House

RETURNED AT CLOSE OUT

2. Variation margin

   The difference between cost of contract and the daily settlement price (closing price) negative margins paid daily/profit or loss

3. Broker commission - negotiated

Section 4

Crude Oil

Forward Markets

CRUDE OIL TRADING

PLAYERS		MAIN ACTIVITY
Oil companies and traders	-	Wet
	-	Forward
	-	Futures/Options
	-	Off exchange
Banks/Commodity Companies/ Financial institutions	-	Forward
	-	Futures
	-	Off exchange
Investors/ Speculators	-	Futures

USE OF MARKET

Buy and sell oil

Speculate

Hedge

Lock in margin

CRUDE OIL TRADING

MARKETS

Wet	-	Nigerian, Iranian, Libyan, Columbian, etc
Forward	-	Brent, Dubai, WTI Cash
Exchange	-	Futures: WTI, Brent
	-	Options: WTI, Brent
Off Exchange (All custom made)	-	Partials
	-	Swaps
	-	OTCs

CRUDE OIL TRADING

PLAYERS

OIL COMPANIES	BP, SHELL COASTAL STATES
TRADER	MARC RICH VITOL ARCADIA
FINANCIAL INSTITUTIONS/ COMMODITY HOUSES	MORGAN STANLEY PHIBRO
INVESTORS/SPECULATORS (FUNDS)	MAN INTERNATIONAL

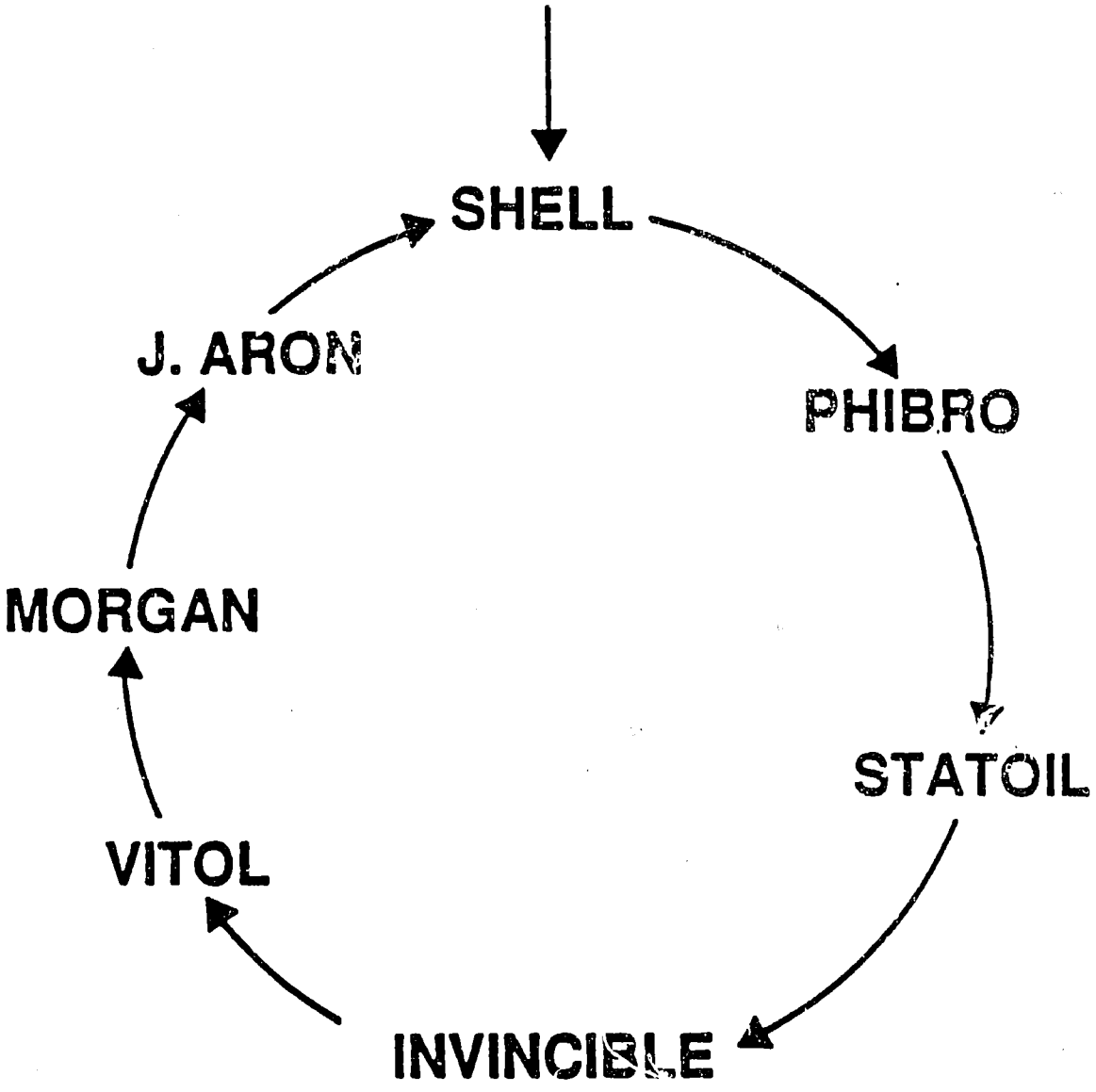
BRENT FORWARD CONTRACT

VOLUME	500,000 BBLS ± 5% OPERATIONAL TOLERANCE
PAYMENT	30 DAYS FROM B/L DATE
NOMINATION	SELLER 15 DAYS BEFORE FIRST DAY OF 3-DAY LAYDAY RANGE
DELIVERY	MONTHS
PERIOD OF LIQUIDITY	3 MONTHS +
NUMBER OF PLAYERS	25 - 30 IN 15-DAY MARKET + 15 - 20 IN WET MARKET
DEALS/DAY	
LAST DAY OF TRADING	PLATTS STOPS QUOTING 15-DAY CONTRACT ON 10TH OF MONTH TRADES TO 18 DAYS PRIOR END MONTH
CARGOES/ MONTH	30 - 60 RANGE
(BRENT/NINIAN)	1990 AVERAGE = 43 1989 AVERAGE = 48 5 YR FORECAST = 30 - 36
CONTRACT	SHELL

DUBAI FORWARD CONTRACT

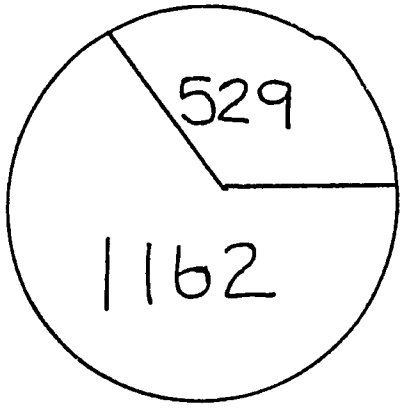
TYPE	Paper contract for delivery in future until a cargo is specified by nomination process
VOLUME	500,000 bbls ± 5% operational tolerance
DELIVERY	F.O.B. Fateh, Dubai in cargo lots
PAYMENT	30 days from B/L date
NOMINATION	Buyer 10th month before lifting month (Subject terminal acceptance - **in effect gives terminal right over dates**
PERIOD OF LIQUIDITY	2 months (not very liquid)
NUMBERS OF PLAYERS	15 - 20 occasionally
DEALS/DAY	5
DELIVERY CARGOES PER MONTH	Approx 25
CONTRACT	Conoco
TYPE OF PLAYERS	Large
OTHER	Unregulated

CHAINS / BOOKOUTS



COMPARISON OF CHARACTERISTICS

	FORWARD	FUTURES
SIZE:	BULK	SMALL
STRUCTURE:	CHAINS OF CONTRACT - DAISY CHAINS	NOVATION - SEPARATION OF BUYER & SELLER
SETTLEMENTS:	OFFSETS/BOOKOUTS BY NEGOTIATION	OFFSET BY CLEARING HOUSE
SECURITY:	SAME AS PHYSICAL DEALS	PROTECTED BY CLEARING HOUSE - MARGIN CALLS & MARK TO MKT DAILY
REGULATION:	INFORMAL BY INDUSTRY	FORMAL EXCHANGE REGULATION
PARTICIPANTS:	FEW	MANY
COSTS:	L/C's BROKER FEES	DEPOSITS EXCHANGE FEES BROKER FEES
PROFIT/LOSS	LATER	UP FRONT



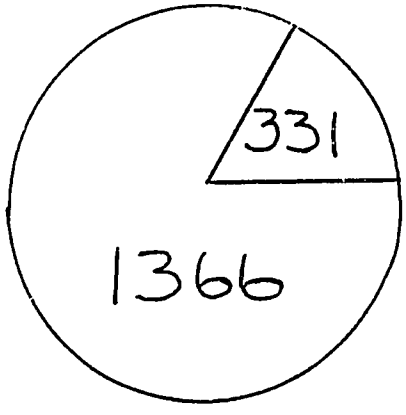
31%

OUTRIGHT

SPREADS

TOTAL = 1,691

1Q 91

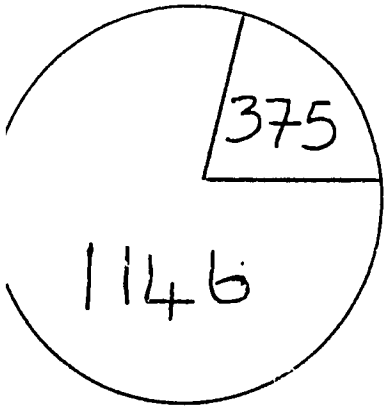


OUTRIGHT

SPREADS
(+ 26% VS 1Q 90)

TOTAL = 1,697

2Q 91



TOTAL = 1,521

APPROX 10% OF SPREADS ARE BRENT/DUBAI
IPE VOLUME = APPROX TWICE BRENT

-92'

Section 5

Products Markets

REFINED PRODUCTS TRADED

- Gasoline
- Naphtha
- Jet grade kerosene
- Burning kerosene
- Gasoil/Heating/Diesel
- High sulphur fuel oil
- Low sulphur fuel oil

PRODUCTS TRADING

GEOGRAPHICAL MARKETS

Rotterdam	-	NW Europe Scandinavia, UK
Mediterranean		
East of Suez	-	Arabian Gulf/Red Sea
Singapore and Japan	-	Asia - Pacific and Australasia
USA	-	East Coast, Gulf Coast Caribbean, and South America
USA	-	West Coast
OTHER		

REFINED PRODUCTS

FUTURES MARKETS

IPE	-	Gasoil
	-	Fuel Oil
NYMEX	-	Unleaded gasoline
		Heating Oil
		Propane

OPTIONS MARKETS

IPE	-	Gasoil
NYMEX	-	Unleaded gasoline
		Heating oil

Finance Houses (O.T.C.)

PRODUCTS TRADING

FORWARD MARKETS

Gasoil	-	Russian Roulette
	-	Fuel oil Domestique Le Havre
Heating Oil	-	Boston bingo
Gasoline	-	Manhattan mogas
	-	Flexi - contract
Heavy fuel oil	-	Littlebrook cargoes
Naphtha	-	NW Europe - Open spec
	-	Far East

CRUDE OIL PRICING BY PRODUCERS

ATLANTIC BASIN

US, NWE, MED

BOTH LOW AND HIGH SULPHUR CRUDES

MARKERS – BRENT

OR WTI/ANS/WTS FOR US

MARKER CRUDES ARE:

- **Reasonably Liquid Markets for Price Risk Management**
- **Related to the Region in Which They Are Produced and/or Consumed**
- ABSOLUTE PRICE LEVELS ARE ESTABLISHED BY FREE MARKET TRADING

EXAMPLE:

BONNY LIGHT – DATED BRENT PLUS 50¢/bbl
AVERAGE OF PLATTS QUOTATIONS
11-20 DAYS AFTER B/L DATE

CRUDE OIL PRICING BY PRODUCERS

MIDDLE EAST

MAINLY HIGH SULPHUR CRUDES

MARKERS – DUBAI AND/OR OMAN (PDO or MPM)

MARKER CRUDES ARE:

- PRODUCED IN REGION BY NON-OPEC INDEPENDENT PRODUCERS
- THE ONLY VISIBLY/FREELY TRADED CRUDES
- ABSOLUTE PRICE LEVELS ARE ESTABLISHED BY FREE MARKET TRADING (HISTORICAL FREE MARKET - PDO)

EXAMPLES:

ARAB LIGHT	AVERAGE OVER MONTH OF LOADING OF OMAN/DUBAI PLATTS QUOTATIONS + X/bbl
QATAR MARINE	PDO + Y/bbl

CRUDE OIL PRICES

ATLANTIC BASIN

CRUDE		TYPICAL RELATIONSHIP vs DATED BRENT $/bbl
FORCADOS	FOB NIGERIA	-0.40 TO +0.40
TAKULA	FOB ANGOLA	—2.20 TO -0.75
IRANIAN HVY.	DEL. ROTTERDAM	-2.80 TO -1.00
OSEBERG	NORTH SEA	-0.30 TO +0.50

MIDDLE EAST

CRUDE	RELATIONSHIP vs DUBAI $/bbl
QATAR LAND	-0.40 TO +1.80

CRUDE OIL PRICING BY PRODUCERS

FAR EAST

ASIA PACIFIC PRICING INDEX – APPI

- BASED ON BASKET OF CRUDES

  MALAYSIAN (TAPIS)

  AUSTRALIAN (GIPPSLAND)

- PRODUCED WEEKLY BY A PANEL – HISTORICAL

INDONESIAN (MINAS):

- OWN PRICING FORMULAE

- PRODUCED MONTHLY
  RELATED TO APPI
  ADJUSTED FOR HISTORICAL DIFFERENTIALS

CRUDE OIL PRICING FOR TRADED CRUDES

Greater number of alternatives include:

- Fixed price
- Related to different months, Brent/Dubai/WTI
- Related to different quotations, eg Platts, Nymex
- Related at different times, eg 5 days round B/L date, average over second half month, last 5 days of month, etc
- Trigger pricing
- Net backs
- In Far East related to TAPIS

HOW TO ESTABLISH PRICE

LINKED TO OIL PUBLICATION

PLATTS RELATED

ARGUS RELATED

COMBINATION PRICING

B/L DATING

MULTIPLES OF DAYS AROUND B/L

ARRIVAL DATE LINKAGES

PART PUBLICATION RELATED – PART FIXED PRICE

Section 6

Crude Oil Pricing & Price Relationships

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LINKED TO FUTURES

EFPS

Screen related pricing

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BACKWARDATION

MARKET SITUATION WHERE PRICES ARE PROGRESSIVELY LOWER IN THE DISTANT DELIVERY MONTHS

EG	BRENT	DATED	20.00
		MAY	19.00
		JUNE	18.00
		JULY	17.00
		AUG	16.00

CONTANGO

MARKET SITUATION WHERE PRICES ARE PROGRESSIVELY HIGHER IN THE DISTANT MONTHS

EG	BRENT	DATED	16.00
		MAY	17.00
		JUNE	18.00
		JULY	19.00
		AUG	20.00

FEATURES OF BACKWARDATION

- PROMPT SUPPLIES TIGHT
- FORWARD DELIVERIES AVAILABLE
- CAN APPLY IN STABLE, RISING OR FALLING PRICE TREND
- OFTEN IN CRUDE OIL MARKETS
- STOCK POLICY OF REFINERS (AND TRADERS)
- LIMITED ONLY BY FUTURE UNCERTAINTIES

FEATURES OF CONTANGO

- PROMPT SUPPLIES SURPLUS
- FORWARD DELIVERIES UNCERTAIN OR PROMPT SURPLUSES EXPECTED TO DISAPPEAR
- CAN APPLY IN STABLE, RISING OR FALLING PRICE TREND
- OFTEN IN PRODUCT MARKETS DUE SEASONALITY
- STOCK POLICY OF END USERS (AND TRADERS)
- LIMITED BY COST OF MONEY AVAILABILITY OF STORAGE

ESTIMATING FUTURE PRICES

FACTORS

1. PRICE TREND

2. BACKWARDATION/CONTANGO

   - COST OF MONEY
   - COST OF STORAGE
   - STOCK POLICIES
   - FACILITIES AVAILABLE
     - ships
     - tankage
   - FLEXIBILITY OF PLAYERS
     - physical
     - traders
   - SQUEEZES
   - SEASONALITY
   - UNCERTAINTIES

Section 7

Products Trading

MECHANICS OF TRADING PRODUCTS

COSTINGS IN PRODUCT TRADING

EXISTING SALE

TO:

FROM:

THIS IS TO CONFIRM THE FOLLOWING TRANSACTION.

SELLER:

BUYER:

PRODUCT: GASOIL

VOLUME: 25,000 MT ± 10% AT SELLER'S OPTION

TYPE OF SALE: CIF COPENHAGEN, DENMARK

QUALITY:

SPECIFIC GRAVITY	.850 MAX
DIESEL INDEX/OR CETANE NO	53 MIN/45 MIN
DISTILLATION FBP	370 °C MAX
CFPP	–11 °C MAX
CLOUD POINT	–2 °C MAX
FLASH POINT	66 °C MIN
SULPHUR	0.2% WT MAX
COLOUR	1 MAX
KIN VISC CS AT 20 °C	6 MAX
WATER & SEDIMENT	0.1% WT MAX

PERIOD: 18 - 23 OCTOBER 1991

PRICE: HIGH OF PLATTS QUOTATION NO 2 FOR GASOIL CIF NWE PLUS $3.50 PER M TON DATE ON B/L AND B/L QUALITY

LAYTIME: SIX HOURS NOR PLUS 36 HOURS SHINC PRO RATA FOR PART CARGO

DEMURRAGE: AT CHARTER PARTY RATE

PAYMENT: BY L/C AGAINST DOCS WITHIN 48 HOURS OF DISCHARGE

INSPECTION: INSPECTORS TO BE APPOINTED BY BUYER AND PAID FOR 50/50 BY SELLER AND BUYER

DUTIES: PRODUCT IS EEC DUTY PAID BASIS ALL OTHER DUTIES/TAXES – BUYERS A/C

OTHER TERMS & CONDITIONS: LATEST MOBIL TERMS

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NEGOTIATING A PHYSICAL DEAL

1st STAGE
(Indication)

* NO COMMITMENT
* TRADER – FINDS OUT MARKET TRENDS/PRICES, ETC
* COMPANY – ASSESSES OUTLETS/AVAILABILITIES FOR REQUIREMENTS
* QUESTIONS ON FLEXIBILITY ARISE
* POSSIBLE PRICING RANGE/BASIS
* CONVERSATIONS WITH SEVERAL ORGANIZATIONS

NEXT STAGES
(Firming up the indication)

* MOVE TOWARDS COMMITMENT
* TRADER CAN USE AND LIKES DEAL
* COMPANY LIKE DEAL
* HOMING IN ON FLEXIBILITY
* LIKELY PRICE RANGE/BASIS
* CONVERSATIONS WITH FEWER ORGANIZATIONS

FINAL STAGES
(Firm Offer)

* COMPANY MAKING OFFER IS COMMITTED
* TIMING OF OFFER IS STATED AND FIXED
* IMPORTANT TERMS ARE FIXED
* OFFER IS A WHOLE
* NORMALLY ONLY ONE AT A TIME

COUNTERS

* DISCUSS INDIVIDUAL ITEMS
* THE OFFERER HAS OPPORTUNITY TO WITHDRAW

FINAL AGREEMENT

* ALL POINTS ARE AGREED AND CONFIRMED BY TELEX

	INDICATION	FIRM OFFER
SELLER	ESSO	ESSO
BUYER	INVINCIBLE	INVINCIBLE
PRODUCT	GASOIL	GASOIL
TYPE OF SALE	FOB	FOB
LOCATION	LONDON	LONDON
QUANTITY	20-30,000 TONS?	22-28,000 TONS
QUALITY	–	ACCEPTABLE
PERIOD	?	
PRICE	?	PL MN –$2.85
PAYMENT	?	L/C, 7 DAYS CREDIT
DESTINATION	N/A	N/A
BROKERAGE/ COMMISSION	NO	NO
LAYTIME	?	6 HRS + 36 HRS SHINC
DEMURRAGE	?	C/P RATE
POST RESTRICTIONS	AWARE	AWARE
INSPECTION	?	–
DUTIES/TAXES	AWARE	SELLER
OTHER TERMS & CONDITIONS	? ESSO GT & C	ESSO GT & C
FREIGHT	?	?

TYPES OF SALE

FOB

CIF

C&F

DELIVERED

OBLIGATIONS, TITLE AND RISK

SEPARATION OF TRANSFER OF TITLE
FROM TRANSFER OF RISK

TYPE OF SALE

RESPONSIBILITIES	TITLE AND RISK OF LOSS

FOB (FREE ON BOARD)

SELLER : Places on buyer's vessel the oil as per the contract	**BUYER** : Assumes title and risk of loss as oil passes the delivery flange of seller's hose connected to buyer's vessel.
At loading port	At loading port

* NOTE * The contract terms, the letter of credit or the letter of indemnity can affect when title and risk of loss occurs.

C & F (COST AND FREIGHT)

SELLER : Delivers the oil as per the contract	**BUYER** : Assumes title and risk of loss as oil passes the delivery flange of seller's vessel
: At discharge port	At loading port

CIF (COST, INSURANCE AND FREIGHT)

Same as in C & F EXCEPT : Seller arranges marine insurance on behalf of buyer.

* NOTE * Title and risk of loss may be varied, from loading port. Some companies prefer this to occur on receipt of documents, after discharge, after NOR etc. This needs clarification in the contract terms or the general terms and conditions used.

DELIVERED/DELIVERED OUTURN

SELLER : Delivers the oil as per the contract	**BUYER** : Assumes title and risk of loss when oil is received in his tank
: In tank at discharge port	: Inside customs at discharge port
: Obligated to pay import/ customs duties.	

QUALITY

DEFINES THE PRODUCT WHICH IS BEING TRADED.
IN TERMS OF INDIVIDUAL SPECIFICATIONS.

ALL SPECIFICATIONS MUST BE MET FOR PRODUCT TO BE ON-GRADE.

SPECIFICATIONS MEASURED USING STANDARD TEST METHODS ON STANDARD EQUIPMENT - ASTM & IP - UNIVERSALLY UNIFORM.

SPECIFICATIONS DESCRIBE:

1. NATURE OF MATERIAL	-	DISTILLATION + SPECIF GRAVITY
2. PURITY OF MATERIAL	-	SULPHUR, WATER, SEDIMENT
3. REQUIRED HANDLING CONDITIONS	-	FLASH POINT, POUR POINT, VISCOSIT
4. PERFORMANCE IN EQUIPMENT	-	OCTANE, DIESEL INDEX CETANE

QUALITY

	SALE	1st ESSO OFFER
SPECIFIC GRAVITY	0.850 max	✓
DIESEL INDEX	53 min	✓
DISTILLATION FBP	370°C max	✓
CFPP	- 11° max	- 9°
CLOUD POINT	- 2° max	0°
FLASH POINT	66° min	✓
SULPHUR	0.2% max	✓
COLOUR	1 max	✓
KIN VISC CS	6 max	✓
WATER + SEDIMENT	0.1% max	✓

PRICING ALTERNATIVES

WHY: FIXED OR MARKET RELATED?

FIXED	:	TAKE A VIEW – MARKET WILL RISE OR FALL
	:	LOCK IN AGAINST FIXED PRICE SALE/PURCHASE
MOVING	:	DON'T WISH TO TAKE A VIEW ON PRICE TREND
	:	LOCK IN AGAINST SIMILAR REFERENCE

prem 0.15		230-233				237-241		
naphtha	+1	207-210	+1		+1	217-220	+1	
jet		210-211						
gasoil	+1	196-197	+1		+1	203-207	+1	
1 pct		101-104				107-108		
3.5 pct		67-68				73-75	+1	
e-4 (1)						29-30		

		cargoes cif nwe basis ara			barges fob rotterdam			cargoes fob nwe	
prem 0.15	-1	231-235	-1	-1	232-233	-1	-1	222-226	-1
reg unl	-1	217-218	-1	-1	217-219	-1			
naphtha nov	+1	209-210							
naphtha phy	+2	218-221	+2	+2	215-218	+2			
jet		226-227			228-230			218-219	
gasoil 0.3	+1	205-206	+1						
gasoil 0.2	+1	208-209		+1	206-207	+1	+1	201-202	
1 pct		102-103		+1	92-93	+1		97-98	
3 pct		75-76						70-71	
3.5 pct		74-75		+1	74-75			69-70	
e-4 (1)	-1	28-30							

0.2 pct gasoil does not include -5 +15 spec. naphtha fob med is basis east med. (1) e-4 prices are quoted as premia over mean of the means of 3.5 pct fuel oil.

ipe gasoil last trade 16.30 gmt 4/10
oct 207.00 nov 209.00 dec 210.00 jan 207.75 feb 202.50 mar 194.50 apr 187.50.

		singapore			fob arab gulf			c+f japan	
mogas unl							+	27.10-27.30	+
mogas 0.15	+	26.20-26.40	+						
naphtha	+	21.40-21.60	+	+	191-194	+	+	206-209	+
kero		26.50-26.90			25.20-25.50			27.30-27.60	
gasoil	+	26.30-26.70	+					26.80-27.00	(a)
gasoil 1/p	+	26.30-26.70	+	+	24.80-25.20	+		27.10-27.40	(b)
hsfo 180 cst		81-83	+		73-75	+		90-92	+
hsfo 380 cst		73-75	+						
lswr 0.3 pct		13.40-13.60						c+f japan	
naphtha ppr		21.30-21.70			nph 2nd 1/2 nov			203-204	
kero ppr	+	27.30-27.60	+		nph 1st 1/2 dec		+	206-208	+
gasoil ppr	+	26.80-27.00	+		nph 2nd 1/2 dec		+	207-209	+

(a) c+f japan cracked. b) c+f japan 'pure'. ppr:paper

		new york spot cif cargoes				fob gulf coast	
unl-87	+	62.50-63.25	+	unl-87	+	60.75-61.25	+
unl-87(boston)	+	63.75-64.25	+				
unl-89	+	65.00-65.50	+	unl-89	+	62.00-63.00	+
unl-92	+	67.50-68.00	+	unl-92	+	64.75-65.75	+
unl-93	+	69.50-70.00	+	naphtha	+	59.75-60.50	+
jet	+	66.00-66.50	+	jet	+	64.25-65.00	+
no.2	+	63.75-64.00	+	no.2	+	61.75-62.50	+
no.2(boston)	+	64.00-64.50	+				
no. 6 0.3 hp		16.65-16.90					
no. 6 0.3 l.p.		17.75-18.00					
no. 6 0.7 max		16.10-16.35		0.7		14.50-14.85	
no. 6 1.0 max		14.75-15.00		1.0		13.50-13.85	
no. 6 2.2 max	+	11.00-11.25	+	3.0	+	10.50-11.00	+
no. 6 3.0 max	+	10.50-10.75	+				

new york, gulf coast eff 3/10 new york numbers include duty

foreign exchange rates close 4/10
dlr/sfr 1.4680 dlr/yen 130.05 dlr/dm 1.6745 dlr/lit 1255.50
pds/dlr 1.7405 dlr/dfl 1.8895 dlr/ff 5.7165

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resending telex: maura teeling (081) 545 6165.

PRICING ALTERNATIVES

FIXED PRICE	IN	$ per barrel (eg crude, fuel oil in USA)
	OR	$ per metric ton (eg products in Europe)
	OR	$ per US gallon (eg light products in USA)

MARKET RELATED PRICE

PRICE IN RELATION TO THE MARKET AT A SPECIFIC LOCATION AND A SPECIFIED TIME

EG

1. Use publications such as:

   Platts
   Petroleum Argus

2. Use Futures Markets, such as:

   NYMEX (New York Merchantile Exchange)
   IPE (International Petroleum Exhange of London)
   SIMEX (Singapore International Monetary Exchange)

CHOOSE:

1. A Specification
2. A time or period of time
3. A discount or premium

CONTRACT VS ESSO PRICES

CONTRACT PRICE: HIGH OF PLATTS 0.2% QUOTATION FOF GASOIL CARGOES PLUS $3.50 PER MT ON B/L DATE

(C/F COPENHAGEN)

ESSO INDICATION PRICE: MEAN OF PLATTS 0.2% QUOTATION FOR GASOIL CARGOES, CIF NWE LESS $1.00 PER MT ON B/L DATE

(FOB THAMES)

- ☐ SAME QUOTATION
- ☐ SAME DATE
- ☐ HIGH · LOW · MEAN?
- ☐ DIFFERENT DIFFERENTIAL DISCOUNT
- ☐ DIFFERENT DIFFERENTIAL PREMIUM
- ☐ CAN START TO GAUGE PROFITABILITY IF KNOW FREIGHT/COSTS

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PRICE REPORTING

PLATTS & PETROLEUM ARGUS

DAILY TELEX SERVICE

- PRICE ASSESSMENTS WORLDWIDE AT EUROPEAN CLOSE OF BUSINESS
- REPORT DEALS DONE IN PHYSICAL & FORWARD MARKETS
- COMMENTARY ON MARKET CONDITIONS

REUTERS AND TELERATE

ELECTRONIC SCREEN SERVICE

- 3 TO 8 HOURLY PRICE ASSESSMENTS WORLDWIDE THROUGHOUT THE DAY
- FUTURES PRICES REPORTED IN ALMOST REAL TIME
- NEWS SERVICE

PAYMENT TERMS

FULLY NEGOTIABLE

VARY DEPENDING ON THE PRODUCT AND REGION

PRODUCTS

EAST/ASIA PACIFIC	30 DAYS B/L DATE
UNITED STATES	X DAYS FROM NOR DATE (ARRIVAL)
EUROPE	5 - 15 DAYS AFTER NOR OR B/L DATE
OTHERS	PROMPT CASH CASH AGAINST DOCUMEN PRE-PAYMENT

(CRUDE - STANDARD 30 DAYS FROM B/L DATE)

WORLDSCALE

The cost of freight on Tankers over about 15000 tons deadweight is normally referred to in terms of a percentage of WORLDSCALE. Worldscale is a schedule of rates applying to any given voyage. The figures published are 100% of worldscale, known as Worldscale flat. The background and a detailed explanation are contained in Section 5 of your course notes.

1. What you need to know

   Load Port(s); discharge Port(s); Routing, and the order the ports will be visited.

2. How to look up rates

   In the main section, the voyages are listed in alphabetical order of discharge ports(s) in heavy type. Under each discharge port(s) will be listed the load port(s).

   Alongside the load port(s) will be found the rate for the voyage in U.S. Dollars per metric tonne.

   Alongside the rate is the routing (where there are alternatives).

   Routing (S) Suez Canal (C) Cape of Good Hope
   (P) Panama Canal.

   The mileage shown is the round trip voyage (Load Port(s) - Discharge Port(s) - Load Port(s)).

3. Differentials

   - If differentials apply to the voyage it is indicated in the main section.

     (a) Pink pages: Fixed and Variable Differentials.

       (i) Fixed differentials (Suez Canal, Panama Canal and others) do not apply the worldscale percentage.
       Note: For Suez and Panama Canal the appropriate NET TONNAGE figure must be obtained from the owner; it is unique for each vessel.

       (ii) Variable differentials.
       These are added to the flat rate and the worldscale percentage is applied.

     (b) Blue pages.

       The main section gives rates from Quoin Island (for Arab Gulf), Uskudar (for Black Sea) and San Carlos Island (for Lake Maracaibo). The differentials from the actual load discharge port(s) are given in the blue pages, and should be added to the above rates and these are variable rates.

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WORLDSCALE

INDEPENDENT

THEORETICAL CALCULATION

UPDATED FOR CHANGE IN PORT CHARGES

LISTED UNDER DISCHARGE PORTS

BLUE PAGES:

LOADING PORT DIFFERENTIALS	ARABIAN GULF
	BLACK SEA
	LAKE MARACAIBO
FIXED DIFFERENTIALS	CANALS
VARIABLE DIFFERENTIALS	

DISTANCES - ROUTEING

UNIVERSAL APPLICATION AND ACCEPTABILITY

CHARTER PARTY

LEGAL AND BINDING CONTRACT

DESCRIPTION OF VESSEL

DESCRIPTION OF VOYAGE OR TRADING

OWNERS OBLIGATIONS

CHARTERERS OBLIGATIONS

REMEDIES IN CASE OF FAILURE TO PERFORM

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LAYTIME

Time that owner allows charterer to carry out loading and discharging

DEMURRAGE

Time that charterer uses in excess of laytime to load and discharge

DETENTION

Time that the charterer uses in port that is not for loading or discharging

DEVIATION

Use of the vessel other than performance of voyage for which owner is paid

FREIGHT COST

	$/MT
London - Copenhagen (WS 100)	3.39
At WS 160	5.24

Todays Platts = $ MT

Purchase PM ■ $2.85 =

= freight 5.24

Sale at PH = $3.50 =

approx margin =

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VALIDITY

FIRM OFFERS MUST HAVE A STATED TIME LIMIT.

THERE ARE NO RULES ABOUT LENGTH OF VALIDITY.

IF NOT STATED - REASONABLENESS IS THE CRITERIA LEGALLY

FACTORS TO CONSIDER:

- TYPE OF PRICING, MARKET RELATED OR FIXED
- VOLATILITY OF MARKET
- NUMBER OF ALTERNATIVES AVAILABLE AT THE TIME

COSTINGS

A. Costs

	$MT
Freight at WS 160	
L/C Costs	5.25
Inspection	0.30
Finance Costs (16 days at 6% pa)	0.50
Insurance	0.25
Demurrage	-
Broker	-
Cargo Losses	
FOB Cost Platts mean - $2.85	180.65
Total Cost	

GENERAL TERMS AND CONDITIONS

DEFINITIONS

MEASUREMENT

NOMINATION PROCEDURES

LOADING & BERTH CONDITIONS

FORCE MAJEURE

PROCEDURES FOR DEALING WITH DISPUTES

EXCEPTIONS AND ESCAPE CLAUSES

ASSIGNMENT

WAIVERS

APPLICABLE LAW

PARTICULAR CONDITIONS OVER-RIDE GENERAL TERMS

GAS OIL PURCHASE FROM ESSO

THIS IS TO CONFIRM THE FOLLOWING TRANSACTION:

SELLER:	ESSO UK LTD.
BUYER:	
DATE:	
PRODUCT:	GASOIL
LOCATION:	FOB LONDON
QUANTITY:	25 - 30,000 TONS AT BUYERS OPTION

QUALITY:

SPECIFIC GRAVITY	.850 MAX
DIESEL INDEX	53 MIN
DISTILLATION FBP °C	370 MAX
CFPP °C	-11 MAX
CLOUD POINT °C	-2 MAX
FLASH POINT °C	66 MIN
SULPHUR PCT WT	0.2 MAX
COLOUR	1 MAX
KIN VISC CS AT 20°C	6 MAX
WATER + SED. PCT WT	0.1 MAX

PERIOD:	B/L DATE ON OR BEFORE 20th OCTOBER
PRICE:	MEAN OF PLATTS No. 2 QUOTATION FOR GASOIL CIF NWE LESS $2.20 PER M.T ON B/L DATE
LAYTIME:	6 HOURS NOR PLUS 36 HOURS SHINC PRO RATA FOR PART CARGO
DEMURRAGE:	AT CHARTER PARTY RATE
PAYMENT:	WITHIN 7 DAYS OF BILL OF LADING DATE AGAINST AN IRREVOCABLE STAND-BY L/C/ OPENED BY A BANK ACCEPTABLE TO SELLERS, ON B/L/ QUANTITY
INSPECTION:	INSPECTORS TO BE APPOINTED BY BUYER AND PAID FOR 50/50 BY SELLER AND BUYER
LOCAL DUTIES AND TAXES:	FOR ACCOUNT OF BUYER

GENERAL TERMS AND CONDITIONS FOR

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Costing and Evaluating Alternatives

Outlet 1 **CIF Singapore**

A Costs	**$/mt**
Freight at WS135 ($7.94) + 0.27	10.99
L/C cost	0.30
Demurrage	0.60
Insurance	0.25
Inspection	0.06
Finance costs (days at 10% PA)	1.85
FOB cost (228.80 - 18.00)	210.80
TOTAL	**$224.85**

8.60bbl/mt = $26.15 bbl

B Customer
A Singapore refiner has a problem.
(Jetty?) needs prompt gasoline.

C Payment
30 days from b/l date, cash against docs

D Price
Indication (on 16/9/91) - Platts mean $26.75 bbl CIF Singapore

E Estimated Profit
$0.60 bbl or $5.16 mt

COSTING AND EVALUATING ALTERNATIVES

Outlet 2 **New York**

A	**Costs**	**$/mt**	**C/Gal**
	Freight at WS 120 ($10.31/mt) + 0.27	12.64	3.51
	Suez canal dues	6.18	1.72
	Out-turn losses		0.31
	Insurance		0.07
	I/C cost		0.08
	Import Duty		1.75
	Inspection		0.02
	Finance costs (19 days @ 10% PA)		0.32
	FOB cost (63.55 - 5.00 C/G)		58.55
	Total Cost		**66.33**

B **Customer**
Intrepid Energy (10% owned by Invincible)

C **Payment**
2 days after completion of discharge invoiced based on out-turn O & O New York, duty paid

D **Price**
Platts mean New York spot cargoes for unleac 87 ron gasoline applicable on nor date at discharge port

E **Estimated Profit/(Loss)**
Unknown - Platts unleaded 87 for 16.9.91 was 61.75 c/gallon which gives loss of 4.58 c/gallon

Conversion 360 gallons = 1mt

COSTING AND EVALUATING ALTERNATIVES

Outlet 3 **C & F Rotterdam**

A Costs

Freight at WS 130 ($7.49) + 0.27	10.01
Suez Canal dues	6.18
L/C cost	0.30
Inspection	0.06
Brokers fee	0.25
Finance cost (3 days @ 10% PA)	0.19
FOB cost ($228.80 – 18.00)	210.80
Total Cost	**$227.79**

B Customer

A European trader indicated through a broker

C Payment

By cash against documents or LOI = invoice by telegraphic transfer

D Price

Platts mean CIF NWE cargoes for unleaded regular gasoline
B/L date (say 16.9.91) = $227.00 mt

E Estimated Loss

($0.79 mt)

Section 8

Tendering

135

TENDERS

- Request to submit offers to buy or sell
- Terms of trade are in tender invitation
- Bidders set own terms if not specified
- Open list or invited participants
- Bids at fixed time
- Some results public - some private
- Can be spot cargoes or term periods

WHY TENDERS?

- Open and fair
- Always a competitive market price
- Clear sign of best deal
- Give time to buy or sell well in advance
- Protects Tenderer with own terms

WHO ISSUES TENDERS?

- **BUYERS AND SELLERS**

- **CRUDE OIL:**

- **BUYERS:**
  - Sri Lanka
  - India
  - Thailand
  - Phillipines
  - Chile
  - U.S.A.
  - Syria
  - Greece
  - Portugal

- **SELLERS:**
  - Tunisia
  - Malaysia
  - Cameroon
  - Columbia
  - Syria
  - Ecuador

PRODUCTS

SELLERS:

India
Sri Lanka
Turkey
Greece
Columbia
Ghana
Malaysia
Pakistan
Syria
Oman
Bangladesh
Taiwan
Saudi Arabia

BUYERS:

Govt. Companies
Public Utilities
Bangladesh
Taiwan
India
Sri Lanka
Turkey
Greece
Portugal
U.S.A.
Zimbabwe
Thailand

RISKS

FOR TENDERER:

- Winner may not perform
- Possibility of no bids
- Offers not good enough
- Changing needs
- Cannot take spot bargains

FOR BIDDER:

- Duration of offer
- Performance bond
- Second round
- Much effort - no reward

TENDERS

What is a Tender?

A tender is a formal open request to submit offers to buy or sell, as the case may be, with the award being made to the most competitive offer.

The specific terms of trade are set out in the request to tender which can either be open to all and sundry or indicated to an invited list of prospective bidders.

If any aspects of the contract are not covered in the tender invitation then it is up to the bidders to set their own terms as part of their bid.

All bids have to be submitted by a pre-agreed date and time and the winner should then be notified.

In some cases the bids are made public in other cases they are kept confidential.

Tenders can be for spot cargoes or term periods.

Who issues tenders?

Buyers and Sellers both issue tenders.

Known users of the tender system have included:

Crude Oil:

Sellers: Tunisia, Malaysia, India, Cameroon, Colombia, Syria, Ecuador.

Buyers: Sri lanka, India, Thailand, Philippines, Chile, U.S.A., Syria, Greece, Portugal, Morocco.

In All the foregoing cases it has been the Government or quasi-government companies who have used tenders.

Products:

Sellers: Government Companies such as: India, Sri Lanka, Turkey, Greece, Colombia, Ghana, Malaysia, Pakistan, Syria, Oman.

Buyers: Government Companies and public utilities including many diverse organizations throughout the World including: India, Sri Lanka, Turkey, Greece, Portugal, U.S.A. (DFSC and local utilities), Zimbabwe, thailand and many more on a local basis.

Why do companies issue Tenders?

The method of tendering is seen to be open and therefore fair. Small local companies may not have a full picture of the market and will not often know the prevailing prices and in these cases a tender ensures they will receive a competitive market price.

By buying under tender you can never be accused of getting it wrong:

Tenders ensure that you cover your specific needs in terms of quality, quantity, timing and other conditions you may wish to impose.

Many companies do not have large commercial or trading departments. People involved have to cover many other things.

In open buying or selling they may well miss the occasional point which could prove very costly in execution of the transaction.

Tendering allows plenty of time to be sure of what you want and dictates when you finally buy/sell.

Risks in Tendering

For Tenderer: Winner may not perform leaving little time to make alternative arrangements.

This has caused performance bonds to be requested by tenderers. Some of the better established Companies gain exemption from this requirement. It is important to negotiate this point at the outset when being put on the circulation list.

There is a risk that no bids will be received. This is unlikely if you have a good mailing list. However if no bids are received you will have to re-tender.

There is a risk that no offer reaches your price expectations but this is usually your own fault meaning you are probably too greedy or too vague in your terms such as for a period too far ahead or asking for the offer to be open for too long a period. Traders see such terms as high risks in a volatile market and weight their prices accordingly to provide safer margins.

Your forward plans may originally indicate certain needs but if these change you may well end up with too much or too little particularly in a term tender.

It may be better to take a certain proportion as base load with the balance on a spot basis to allow for variations.

For bidder Duration of offer. Obviously if you make a bid under tender you wish to know the result as soon as possible because you are locked into that offer for the duration of the tender period.

In some instances all the bids are known when the tender close and the best bids are requested to re-submit revised bids in what has become a transparent market place where you are expected to improve your offer.

There is the risk that you will have spent a lot of time and effort on the tender and no award is made for whatever reason.

Perhaps the bids did not come up to expectation. Perhaps the original tender was only ever a market gathering exercise. Perhaps the needs of the tenderer have changed in the interim period.

When bids are published and the award is made everyone knows what your price is and if you then have to trade the position your competitors know all your costs.

<u>Addendum</u> Trader can often protect his risk whilst bid is valid by hedging on the futures market but this in itself is a risk if you are not awarded the business.

Typical Contents of a Fuel Oil Tender

TO: INVINCIBLE OIL CO. NEW YORK

FROM: CANAL ELECTRIC COMPANY

You are invited to tender for the supply of Fuel Oil to our power station.

The following requirements should be met in this tender:

1. Product

   High sulphur No. 6 Fuel Oil conforming to the specifications attached in Annex 1.

2. Quantity

   Approximately 1 million bbls.

3. Period

   To be supplied over a period of three months on an approximately even flow basis with first cargo arrival on or before 10th May 1991.

4. Price

   Price should be delivered at buyers designated terminal Sandwich, Massachusetts based on out-turn quantities and may be quoted on a fixed basis or escalating/de-escalating with Platts estimated New York Harbour spot price on or around Notice of Readiness date for max. 2.2%S residual fuel oil. Insurance to be for sellers account.

5. Payment

   Your terms of payment should be stipulated.

6. Parcel Sizes and Delivery Schedule

   In approx. 350,000 bbl parcels on an even flow basis in vessels conforming to the following maximum dimensions: 825ft LOA. no Beam restriction 40 ft draft.

7. Quantity and Quality

   The determination of quantity and quality of fuel oil delivered shall be made in accordance with accepted practice at the discharge port by a mutually acceptable recognized independent petroleum inspector who shall prepare and sign certificates as to the quantity and quality of the fuel oil delivered by the seller.

8. Discharging Conditions

(a) When the vessel has arrived at the Port of Sandwich, Massachusetts (or as near thereto as she can safely get) and is ready to discharge, a notice of readiness (NOR) shall be tendered to CANAL ELECTRIC or its representative, as the case may be, by the master.

(b) CANAL ELECTRIC shall be allowed one half of the charter party laytime, but in any event not less than a total of:

(a) 6 hours, and
(b) 36 hours for a cargo of 350,000 bbls or pro rate for a part cargo.

(c) Laytime shall start to count:

(1) In case of the vessel having tendered NOR within three days either side of the confirmed ETA, upon tender of NOR;
(2) In the case of the vessel arriving outside the range of three days either side of the confirmed ETA, Upon commencement of discharge.

9. Other Terms and Conditions

Tenderers are invited to disclose other general terms and conditions which will be considered as forming part of their offer.

10. Validity

Offers should be received by CANAL ELECTRIC before 1.00 p.m. British Summer Time 24th April 1991 and remain valid for 24 hours.

11. Award of Tender

CANAL ELECTRIC reserves the right to award the tender in whole or in part or not at all.

CANAL ELECTRIC COMPANY 18th April 1991

CANAL ELECTRIC COMPANY
FUEL OIL SPECIFICATIONS

SULPHUR, WT. %	2.20 max
GRAVITY, API	10 min
VISCOSITY, SSF AT 122 F	400 max
SEDIMENT, WT. %	.25 max
POUR POINT, DEG F	60 max
FLASH POINT, DEG F	150 min
WATER, WT %	1.0 max
ASH, WT. %	.10 max
VANADIUM, PPM	400 max
SODIUM, PPM	70 max
ASPHALTENES, WT. %	13 max
BTU/GALLON	151,000 min

Section 9

Shipping

WORLDSCALE

The cost of freight on Tankers over about 15000 tons deadweight is normally referred to in terms of a percentage of WORLDSCALE. Worldscale is a schedule of rates applying to any given voyage. The figures published are 100% of Worldscale, known as Worldscale flat. The background and a detailed explanation are contained in Section 5 of your course notes.

1. What you need to know

   Load Port(s); Discharge Port(s); routing, and the order the ports will be visited.

2. How to look up rates

   In the main section, the voyages are listed in alphabetical order of discharge port(s) in heavy type. Under each discharge port(s) will be listed the load port(s).

   Alongside the load port(s) will be found the rate for the voyage in U.S. Dollars per metric tonne.

   Alongside the rate is the routing (where there are alternatives).

   Routing (S) Suez Canal (C) Cape of Good Hope
   (P) Panama Canal.

   the mileage shown is the round trip voyage (Load Port(s) - Discharge Port(s) - Load Port(s)).

3. Differentials

   - If differentials apply to the voyage it is indicated in the main section.

     (a) Pink Pages: Fixed and Variable Differentials.

     (i) Fixed differentials (Suez Canal, Panama Canal and others) do not apply the worldscale percentage.
     Note: For Suez and Panama Canal the appropriate NET TONNAGE figure must be obtained from the owner; it is unique for each vessel.

     (ii) Variable differentials.
     These are added to the flat rate and the worldscale percentage is applied.

     (b) Blue pages.

     The main section gives rates from quoin Island for Arab Gulf), Uskudar (for Black Sea) and San Carlos Island (for Lake Maracaibo). The differentials from the actual load discharge port(s) are given in the blue pages, and should be added to the above rates

WORLDSCALE

INDEPENDENT

THEORETICAL CALCULATION

UPDATED FOR CHANGE IN PORT CHARGES

LISTED UNDER DISCHARGE PORTS

BLUE PAGES:

LOADING PORT DIFFERENTIALS	ARABIAN GULF
	BLACK SEA
	LAKE MARACAIBO
FIXED DIFFERENTIALS	CANALS
VARIABLE DIFFERENTIALS	

DISTANCES - ROUTEING

UNIVERSAL APPLICATION AND ACCEPTABILITY

LAYTIME

Time that Owner allows Charterer to carry out loading and discharging

DEMURRAGE

Time that Charterer uses in excess of laytime to load and discharge

DETENTION

Time that the Charterer uses in port that is not for loading or discharging

DEVIATION

Use of the vessel other than performance of voyage for which owner is paid

CHARTER PARTY

LEGAL AND BINDING CONTRACT

DESCRIPTION OF VESSEL

DESCRIPTION OF VOYAGE OR TRADING

OWNERS OBLIGATIONS

CHARTERERS OBLIGATIONS

REMEDIES IN CASE OF FAILURE TO PERFORM

FREIGHT COSTS

WORLDSCALE	$/MT
YANBU-ROTTERDAM	7.49 (S)
VARIABLE DIFF ROTTERDAM PRODUCTS	0.49
AT W 100	7.98
AT W 220	17.56

SUEZ CANAL	$
16,400 SCNT X $8.23	134,972
+ LUMPSUM	50,400
	185,372
BASIS 30,000 MT	$ 6.18/MT

FREIGHT COST	
AT WORLDSCALE 220	17.56
SUEZ	6.18
FIXED DIFF YANBU	0.27
	$24.01/MT

Genoa	6.60	5518
Ghent	3.50	1368
Ghent & Antwerp	4.75	1444
Ghent & Rotterdam (See page D-7)	3.99	1421
Gothenburg	2.87	274
Gothenburg & Brofjorden	3.61	382
Grangemouth	3.99	1276
Guayanilla (See Circ. 1/91)	8.44	8666
Gulf of Izmit	8.18	7488
Gulfhavn	2.20	286
Hamburg	3.17	1018
Havre	3.68	1596
Helsinki	5.87	1330
Houston (See Circ. 1/91)	9.85	10634
Huelva	4.83	3678
Humber River	3.44	1212
Iskenderun	8.35	7868
Istanbul	8.16	7424
Jeddah	9.09 S	8922
Kalundborg	2.56	230
Kalundborg & Slagen	3.60	583
Karachi	19.52 C	22732
Karachi	12.54 S	13194
Karlshamn	3.27	518
Klaipeda	3.62	869
La Plata	12.90	13732
La Plata & Cabo San Antonio (TSA)	13.13	13822
La Skhirra	6.41	5884
Las Palmas	5.55	4600
Lavera	6.41	5194
Leghorn	6.50	5550
Leixoes	4.01	2962
Lisbon	4.29	3274
Loire River (See page D-8)	5.00	2320
London	3.39	1356
London & Dunkirk	4.33	1454
London & Humber River	4.57	1484
London & Rotterdam (See page D-7)	3.91	1446
Luanda	10.20	11056
Mamonal	9.30	9906
Manchester Ship Canal	4.88	2120
Marsa el Brega	7.09	6586
Marseilles	6.27	5204
Milazzo	6.85	5820
Milazzo & Cagliari	7.34	5843
Milazzo & Rotterdam (See page D-7)	7.34	5877
Milford Haven	3.88	2158
Milford Haven & Ghent	4.98	2276
Milford Haven & Rotterdam (See page D-7)	4.37	2215
Milford Haven & Southampton	4.66	2170
Mohammedia	5.11	3870
Mongstad	3.04	974
Montreal	7.42	6934
Naantali	5.91	1222
Naples	6.52	5782
Nynashamn	3.57	933
Ornskoldsvik	3.64	1529
Paranagua	11.28	12206
Philadelphia (See Circ. 1/91)	7.71	7640
Piraeus	7.17	6786
Port Gentil (See page D-8)	10.31	10189
Port Harcourt (See page D-4)	9.41	9930
Port Said	7.75	7650
Porto Torres	6.13	5298
Porvoo	5.95	1384
Puerto Ordaz	8.96	9444
Puerto la Cruz	9.02	9286
Puerto Ios Minas	9.56	10278
Punta Cardon	9.14	9426
Punta Cardon & Freeport (Bahamas)	10.08	10160
Quoin Island (See page 1)	19.16 C	22694
Quoin Island (See page 1)	12.11 S	13054
Ras Lanuf (See page D-8)	7.35	6504
Ravenna	7.78	7085
Rijeka	7.51	7069
Rio de Janeiro	11.02	11588
Rostock	2.83	339
Rotterdam (See page D-7)	2.82	1216
Rotterdam & Amsterdam (See page D-7)	3.81	1248
Rotterdam & Antwerp (See page D-7)	4.20	1461
Rotterdam & Fredericia (See page D-7)	3.92	1377
Rotterdam & Hamburg (See page D-7)	3.93	1422
Rotterdam & Slagen (See page D-7)	3.68	1359
Rotterdam & Southampton (See page D-7)	3.92	1655
Rouen	4.25	1736
Rouen & Bremen	5.77	1940
Rouen & Havre	5.19	1736
Rouen & Rotterdam (See page D-7)	4.74	1793
Rouen & Tees River (See page D-8)	5.36	1920
Salvador (Brazil)	9.74	10218
San Carlos Island (See page 19)	8.86	9564
San Juan (P.R.) (See Circ. 1/91)	8.25	8450
Santa Pansgie Bay	6.86	5888
Santos	11.10	11962
Sao Sebastiao	11.16	11848
Sidon	7.59	7816
Sines	4.57	3356
Skikda (See page D-3)	5.71	5028
Skredsvik	2.69	370
Slagen	2.55	468
Slagen & Kalundborg	3.61	583
Slagen & Oslo	3.23	546
Southampton	3.44	1598
Southampton & London	4.39	1657
Southampton & Rotterdam (See page D-7)	3.92	1655
St. Croix	8.22	8456
St. John (N.B.)	6.77	6570
St. John's (NF.)	5.46	4908
Stavanger	2.67	764
Stettin	2.83	530
Stockholm	3.48	1072
Suez	20.56 C	23908
Suez	8.34 S	7650
Sullom Voe	3.51	1218
Swansea	4.12	2184
Tampico	10.20	10814
Tarbert	4.32	2206
Tartous	7.62	7840
Tees River (See page D-8)	3.32	1184
Tees River & Amsterdam (See page D-8)	4.47	1425
Tees River & Hamburg (See page D-8)	4.51	1510
Tema	8.73	9048
Teneriffe	5.69	4594
Thessaloniki	7.25	7206
Thistle Field	2.37	1098
Trinidad	8.59	9012
Trinidad & Beaumont (See Circ. 1/91)	11.16	12000
Tripoli (Lebanon)	7.63	7860
Tyne River	3.46	1184
Uskudar (See page 17)	7.58	7424
Ventspils	3.63	942
Whitegate	3.91	2222
Wilhelmshaven	2.96	940
Wismar	2.85	364
Zewie	6.74	5968
COPENHAGEN & AALBORG		
Aalesund	3.86	1290
Aden	19.24 C	21394
Aden	11.10 S	10350
Algiers (See page D-3)	6.27	4734
Amsterdam	4.17	1230
Antwerp	4.59	1494
Antwerp & Rotterdam (See page D-7)	5.08	1547
Augusta	7.54	5984
Augusta & Cagliari	8.05	6040
Bordeaux	6.02	2674
Brofjorden	3.65	459
Brunsbuttel	3.94	1032
Cagliari	7.00	5358
Caripito	9.55	9266
Cartagena (Spain)	6.39	4384
Castellon	6.63	4730
Curacao	9.89	9382
Dunkirk	4.27	1470
El Palito	9.93	9450

C

VARIABLE RATE DIFFERENTIALS

Differentials to be added to or deducted from, as hereinafter specified, the applicable rate of freight or, in the case of 1. (2) (ROTTERDAM), added as a separate element of the freight payment. Such variable rate differentials are subject to the percentage variation which the contracting parties have agreed to apply to Worldscale rates.

1. ROTTERDAM (Netherlands)

   (1) When Rotterdam is the only loading or discharging port, an addition (in respect of Harbour Dues) must be made to the Rotterdam rate applicable to the voyage in question in accordance with the following table.

   (A) Loading Crude

   USD 0.30 per tonne of the cargo quantity to which the rate of freight is applied.

   (B) Loading Products or Crude and Products

   USD 0.49 per tonne of the cargo quantity to which the rate of freight is applied.

   (C) Discharging Crude or Crude and Products

   USD 0.83 per tonne of the cargo quantity to which the rate of freight is applied.

   (D) Discharging Products

   USD 0.49 per tonne of the cargo quantity to which the rate of freight is applied.

   (2) When Rotterdam is combined with other loading or discharging ports, a differential (in respect of Harbour Dues) must be added, as a separate element of the freight payment, in accordance with the following table.

   (A) Loading Crude

   USD 0.30 per tonne of the cargo quantity to which the rate of freight is applied.

   (B) Loading Products or Crude and Products

   USD 0.49 per tonne of cargo loaded at Rotterdam.

   (C) Discharging Crude or Crude and Products.

   USD 0.83 per tonne of cargo discharged at Rotterdam.

   (D) Discharging Products

   USD 0.49 per tonne of cargo discharged at Rotterdam.

2. AQABA (Jordan) (The published rates are based upon the Al Mushterak Berth).

   When cargo is loaded or discharged at the Aqaba Oil Terminal, an addition of USD 0.55 must be made to the Aqaba rate applicable to the voyage in question.

3. BONNY (Nigeria) (The published rates are based upon the Inshore Terminal).

   When cargo is loaded or discharged at the Offshore Terminal, Bonny, a deduction of USD 0.21 must be made from the Bonny rate applicable to the voyage in question.

   NB (1) If a voyage involves both the Offshore Terminal, Bonny and Lagos or Port Harcourt a deduction of only USD 0.06 should be made.

   NB (2) If a voyage involves both the Offshore and Inshore terminals at Bonny, no deduction should be made, the costs incurred at the Offshore Terminal being regarded as part of shifting expenses, irrespective of the order in which the vessel calls at the terminals.

4. DAE SAN (Korea – South) (The published rates for discharging are based upon the Kukdong SBM).

   When cargo is discharged at berths other than the Kukdong SBM, an addition of USD 0.17 must be made to the Dae San rate applicable to the voyage in question.

5. FUNAKAWA (Japan) (The published rates are based upon Akita Power Station).

   When cargo is loaded or discharged at the Funakawa Stockpiling Terminal, an addition of USD 0.62 must be made to the Funakawa rate applicable to the voyage in question.

FIXED RATE DIFFERENTIALS (Cont.)

17. **SAUDI ARABIA** (In respect of Cargo Handling Fees assessed on the quantity of cargo loaded or discharged at the Saudi Arabian ports of Jubail and/or Rabigh and/or Yanbu).

(1) JUBAIL (Products)

(A) Loading

USD 0.27 per tonne of cargo loaded at Jubail.

(B) Discharging

USD 0.54 per tonne of cargo discharged at Jubail.

(2) RABIGH/YANBU

(A) Loading

(a) Products

USD 0.27 per tonne of cargo loaded at Rabigh or Yanbu.

(b) Crude

USD 0.54 per tonne of cargo loaded at Rabigh or Yanbu.

(B) Discharging

(a) Products

USD 0.54 per tonne of cargo discharged at Rabigh or Yanbu.

(b) Crude

USD 0.54 per tonne of cargo discharged at Rabigh or Yanbu.

18. **SRI LANKA** (In respect of Tonnage Dues and Special Cargo Dues (or Stevedoring Charges) assess the quantity of cargo loaded or discharged at the ports of Colombo and/or Trincomalee in Sri Lanka).

(1) Loading

USD 0.67 per tonne of cargo loaded at Colombo or Trincomalee.

(2) Discharging

USD 0.35 per tonne of cargo discharged at Colombo or Trincomalee.

19. **TANZANIA** (In respect of Handling Charges assessed on the quantity of cargo loaded or discharged at the ports of Dar-es-Salaam and/or Mtwara in Tanzania).

(1) Crude Oil

USD 0.20 per tonne of cargo discharged at Dar-es-Salaam or Mtwara

(2) Petroleum Products

USD 0.85 per tonne of cargo loaded or discharged at Dar-es-Salaam or Mtwara.

FIXED RATE DIFFERENTIALS (Cont.)

2. **SUEZ CANAL** (In respect of Transit Tolls and Expenses).

NB (1) The Associations understand that the Suez Canal Authority may impose surcharges on transit dues, apparently assessed on an individual basis for each transit, in respect of certain classes of vessels transitting the Canal. Currently, circulars issued by the Authority refer to:

(A) Vessels making a southbound transit on a draft of more than 42 feet;
(B) Vessels with a beam of more than 140 feet making a northbound transit;
(C) Vessels with a beam of more than 218 feet making a southbound transit.

Therefore, the following provisions do not apply to such vessels/transits and it is the responsibility of the contracting parties to agree between themselves a method of settlement in respect of transit dues, surcharges, escort tugs and transit expenses for voyages involving such vessels/transits.

NB (2) The total amount payable, as calculated in accordance with the following provisions, is the same, irrespective of the amount of cargo carried, unless it is otherwise specifically agreed.

NB (3) Please note that in calculating the following figures a rate of exchange of 1 SDR = USD 1.39 was used, the average applicable during September 1990.

NB (4) SCNT means Suez Canal Net Tonnage as assessed by the Canal Authority for the transit in question.

	VESSELS SCNT	CARGO	LADEN & BALLAST TRANSITS (Indicated by letter S)	BALLAST TRANSIT ONLY (Indicated by letters CS)
(1)	5,000/10,000	Crude and/or Products	USD 9.02 per ton of SCNT plus a lump sum of USD 42,500	USD 4.02 per ton of SCNT plus a lump sum of USD 19,300
(2)	10,001/20,000	Crude and/or Products	USD 8.23 per ton of SCNT plus a lump sum of USD 50,400	USD 3.68 per ton of SCNT plus a lump sum of USD 22,800
(3)	20,001/70,000	Crude	USD 3.72 per ton of SCNT plus a lump sum of USD 140,500*	USD 1.67 per ton of SCNT plus a lump sum of USD 62,800
		Products or Crude & Products	USD 4.32 per ton of SCNT plus a lump sum of USD 128,500*	USD 1.67 per ton of SCNT plus a lump sum of USD 62,800
(4)	over 70,000	Crude	USD 3.32 per ton of SCNT plus a lump sum of USD 170,400*	USD 1.49 per ton of SCNT plus a lump sum of USD 76,300**
		Products or Crude & Products	USD 4.14 per ton of SCNT plus a lump sum of USD 142,900*	USD 1.49 per ton of SCNT plus a lump sum of USD 76,300**

NOTES

(A) *If the sdw. of the vessel concerned is under 130,000 tonnes, and the voyage involves a northbound laden transit on a draft of more than 47 feet, the lump sum should be increased by USD . . . . . .

(B) *If the sdw. of the vessel concerned is 130,000 tonnes or over, and the voyage involves a laden and a ballast transit (S), the lump sum should be increased as follows:

130,000/170,000 tonnes sdw.	USD . . . . .
170,001/250,000 tonnes sdw.	USD . . . . .
over 250,000 tonnes sdw.	USD . . . . .

(C) **If the sdw. of the vessel concerned is over 250,000 tonnes, and the voyage involves a ballast transit only (CS), the lump sum should be increased by USD . .

Association of Ship Brokers
& Agents (U.S.A.), Inc.

October 1977

CODE WORD FOR THIS
CHARTER PARTY:

ASBATANKVOY

TANKER VOYAGE CHARTER PARTY

PREAMBLE

_____ _____
Place Date

IT IS THIS DAY AGREED between _____

chartered owner/owner (hereinafter called the "Owner") of the _____ .

SS/MS _____ (hereinafter called the "Vessel")

and _____ _____ (hereinafter called the "Charterer")

that the transportation herein provided for will be performed subject to the terms and conditions of this Charter Party, which includes this Preamble and Part I and Part II. In the event of a conflict, the provisions of Part I will prevail over those contained in Part II.

PART I

A. Description and Position of Vessel:

Deadweight: tons (2240 lbs.) Classed:

Loaded draft of Vessel on assigned summer freeboard ft. in. in salt water.

Capacity for cargo: tons (of 2240 lbs. each) % more or less. Vessel's option.

Coated: ☐ Yes ☐ No

Coiled: ☐ Yes ☐ No Last two cargoes:

Now: Expected Ready:

B. Laydays:

Commencing: Cancelling:

C. Loading Port(s)

Charterer's Option

D. Discharging Port(s):

Charterer's Opt.

E. Cargo:

Charterer's Option

per ton (of 2240 lbs. each)

H. Total Laytime in Running Hours:

Demurrage per day:

. Commission of % is payable by Owner to

on the actual amount freight. when and as freight is paid.

C. The place of General Average and arbitration proceedings to be London·New York (strike out one).

.. Tovalop: Owner warrants vessel to be a member of TOVALOP scheme and will be so maintained throughout duration of this charter.

I. Special Provisions:

IN WITNESS WHEREOF, the parties have caused this Charter, consisting of a Preamble, Parts I and II, to be executed in duplicat
of the day and year first above written.

ness the signature of: _____

By: _____

ness the Signature of: _____

By: _____

PART II

WARRANTY—VOYAGE—CARGO. The vessel, classed as specified in Part I hereof, so maintained during the currency of this Charter, shall, with all convenient dispatch, as ordered to Loading Port(s) named in accordance with Clause 4 hereof, or so near as she may safely get (always afloat), and being seaworthy, and having all pipes, and heater coils in good working order, and being in every respect fitted for the voyage, the foregoing conditions can be attained by the exercise of due diligence, perils of the any other cause of whatsoever kind beyond the Owner's and/or Master's control excepted, (always afloat) from the factors of the Charterer a full and complete cargo of petroleum products in bulk, not exceeding what she can reasonably stow and carry over and above fuel, consumable stores, boiler feed, culinary and drinking water, and complement effects (sufficient space to be left in the tanks to provide for the expansion of the cargo), g so loaded shall forthwith proceed, as ordered on signing Bills of Lading, direct to the ging Port(s), or so near thereunto as she may safely get (always afloat), and deliver said heating of the cargo is requested by the Charterer, the Owner shall exercise due to maintain the temperatures requested.

FREIGHT. Freight shall be at the rate stipulated in Part I and shall be computed on quantity (except deadfreight as per Clause 3) as shown on the Inspector's Certificate of on. Payment of freight shall be made by Charterer without discount upon delivery of destination, less any disbursements or advances made to the Master or Owner's agents of loading and/or discharge and cost of insurance thereon. No deduction of freight shall for water and/or sediment contained in the cargo. The services of the Petroleum r shall be arranged and paid for by the Charterer who shall furnish the Owner with a the Inspector's Certificate.

DEADFREIGHT. Should the Charterer fail to supply a full cargo, the Vessel may, at er's option, and shall, upon request of the Charterer, proceed on her voyage, provided tanks in which cargo is loaded are sufficiently filled to put her in seaworthy condition. event, however, deadfreight shall be paid at the rate specified in Part I hereof on the e between the intake quantity and the quantity the Vessel would have carried if loaded minimum permissible freeboard for the voyage.

NAMING LOADING AND DISCHARGE PORTS.

(a) The Charterer shall name the loading port or ports at least twenty-four (24) hours the Vessel's readiness to sail from the last previous port of discharge, or from bunkering the voyage, or upon signing this Charter if the Vessel has already sailed. However, er shall have the option of ordering the Vessel to the following destinations for wireless

	On a voyage to a port or ports in:
T KITTS	Caribbean or U.S. Gulf loading port(s)
ORT SAID	Eastern Mediterranean or Persian Gulf loading port(s) (from ports west of Port Said)

(b) If lawful and consistent with Part I and with the Bills of Lading, the Charterer shall option of nominating a discharging port or ports by radio to the Master on or before the arrival at or off the following places:

Place	*On a voyage to a port or ports in:*
AND'S END	United Kingdom/Continent (Bordeaux/Hamburg range) or Scandinavia (including Denmark)
UEZ	Mediterranean (from Persian Gulf)
IBRALTER	Mediterranean (from Western Hemisphere)

(c) Any extra expense incurred in connection with any change in loading or discharging s named) shall be paid for by the Charterer and any time thereby lost to the Vessel shall s used laytime.

LAYDAYS. Laytime shall not commence before the date stipulated in Part I, except e Charterer's sanction. Should the Vessel not be ready to load by 4:00 o'clock P.M. (local the cancelling date stipulated in Part I, the Charterer shall have the option of cancel- Charter by giving Owner notice of such cancellation within twenty-four (24) hours after cancellation date; otherwise this Charter to remain in full force and effect.

NOTICE OF READINESS. Upon arrival at customary anchorage at each port of or discharge, the Master or his agent shall give the Charterer or his agent notice by telegraph, wireless or telephone that the Vessel is ready to load or discharge cargo, berth berth, and laytime, as hereinafter provided, shall commence upon the expiration of six (6) after receipt of such notice, or upon the Vessel's arrival in berth (i.e., finished mooring at a sealoading or discharging terminal and all fast when loading or discharging alongside), whichever first occurs. However, where delay is caused to Vessel getting into berth ving notice of readiness for any reason over which Charterer has no control, such delay not count as used laytime.

HOURS FOR LOADING AND DISCHARGING. The number of running hours specilaytime in Part I shall be permitted the Charterer as laytime for loading and discharging but any delay due to the Vessel's condition or breakdown or inability of the Vessel's es to load or discharge cargo within the time allowed shall not count as used laytime. If tions of the Owner or port authorities prohibit loading or discharging of the cargo at night, lost shall not count as used laytime; if the Charterer, shipper or consignee prohibits or discharging at night, time so lost shall count as used laytime. Time consumed by the in moving from loading or discharge port anchorage to her loading or discharge berth, ging ballast water or slops, will not count as used laytime.

DEMURRAGE. Charterer shall pay demurrage per running hour and pro rata for a hereof at the rate specified in Part I for all time that loading and discharging and used e as elsewhere herein provided exceeds the allowed laytime elsewhere herein specified. If, er, demurrage shall be incurred at ports of loading and/or discharge by reason of fire, ion, storm or by a strike, lockout, stoppage or restraint of labor or by breakdown of nery or equipment in or about the plant of the Charterer, supplier, shipper or consignee cargo, the rate of demurrage shall be reduced one-half of the amount stated in Part I per g hour or pro rata for part of an hour for demurrage so incurred. The Charterer shall not le for any demurrage for delay caused by strike, lockout, stoppage or restraint of labor for r, officers and crew of the Vessel or tugboat or pilots.

9. SAFE BERTHING—SHIFTING. The vessel shall load and discharge at any safe place arf, or alongside vessels or lighters reachable on her arrival, which shall be designated and ed by the Charterer, provided the Vessel can proceed thereto, lie at, and depart therefrom s safely afloat, any lighterage being at the expense, risk and peril of the Charterer. The erer shall have the right of shifting the Vessel at ports of loading and/or discharge from safe berth to another on payment of all towage and pilotage shifting to next berth, charges mooring lines on arrival at and leaving that berth, additional agency charges and expense, ms overtime and fees, and any other extra port charges or port expenses incurred by reason ng more than one berth. Time consumed on account of shifting shall count as used laytime as otherwise provided in Clause 15.

10. PUMPING IN AND OUT. The cargo shall be pumped into the Vessel at the expense, and peril of the Charterer, and shall be pumped out of the Vessel at the expense of the , but at the risk and peril of the Vessel only so far as the Vessel's permanent hose ections, where delivered, the cargo shall be taken by the Charterer or its consignee. If ed by Charterer, Vessel after discharging is to clear shore pipe lines of cargo by pumping through them and time consumed for this purpose shall apply against allowed laytime. Vessel shall supply her pumps and the necessary power for discharging in all ports, as well cessary hands. However, should the Vessel be prevented from supplying such power by s of regulations prohibiting fires on board, the Charterer or consignee shall supply, at its se, all power necessary for discharging as well as loading, but the Owner shall pay for supplied to the Vessel for other purposes. If cargo is loaded from lighters, the Vessel shall sh steam at Charterer's expense for pumping cargo into its Vessel, if requested by the erer, providing the Vessel has facilities for generating steam and is permitted to have fires ard. All overtime of officers and crew incurred in loading and/or discharging shall be for nt of the Vessel.

11. HOSES: MOORING AT SEA TERMINALS. Hoses for loading and discharging shall nished by the Charterer and shall be connected and disconnected by the Charterer, or, at tion of the Owner, by the Owner at the Charterer's risk and expense. Laytime shall ue until the hoses have been disconnected. When Vessel loads or discharges at a sea nal, the Vessel shall be properly equipped at Owner's expense for loading or discharging in place, including suitable ground tackle, mooring lines and equipment for handling arine hoses.

12. DUES—TAXES—WHARFAGE. The Charterer shall pay all taxes, dues and other es on the cargo, including but not limited to Customs overtime on the cargo, Venezuelan tation Tax, C.I.M. Taxes at Le Havre and Portuguese Imposto de Comercio Maritimo. The [illegible] on freight at loading or discharging ports and any unusual

or barratry of the Master, pilots, mariners or other servants of the Owner in the navigat management of the Vessel; fire, unless caused by the personal design or neglect of the Own collision, stranding or peril, danger or accident of the sea or other navigable waters; saving or attempting to save life or property; wastage in weight or bulk, or any other loss or damage arising from inherent defect, quality or vice of the cargo; any act or omission of the Charterer or Owner, shipper or consignee of the cargo, their agents or representatives; insufficiency of packing; insufficiency or inadequacy or marks; explosion, bursting of boilers, breakage of shafts or any latent defect in hull, equipment or machinery; unseaworthiness of the Vessel unless caused by want of due diligence on the part of the Owner to make the Vessel seaworthy or to have her properly manned, equipped and supplied; or from any other cause of whatsoever kind arising without the actual fault of privity of the Owner. And neither the Vessel nor Master or Owner nor the Charterer, shall, unless otherwise in this Charter expressly provided, be responsible for any loss of damage or delay or failure in performing hereunder, arising or resulting from —Act of God; act of war; perils of the seas; act of public enemies, pirates or assailing thieves, arrest or restraint of princes, rulers or people; or seizure under legal process provided bond is promptly furnished to release the Vessel or cargo; strike or lockout or stoppage or restraint of labor from whatever cause, either partial or general; or riot or civil commotion.

20. ISSUANCE AND TERMS OF BILLS OF LADING

(a) The Master shall, upon request, sign Bills of Lading in the form appearing below for all cargo shipped but without prejudice to the rights of the Owner and Charterer under the terms of this Charter. The Master shall not be required to sign Bills of Lading for any port which, the Vessel cannot enter, remain at and leave in safety and always afloat nor for any blockaded port.

(b) The carriage of cargo under this Charter Party and under all Bills of Lading issued for the cargo shall be subject to the statutory provisions and other terms set forth or specified in sub-paragraphs (i) through (viii) of this clause and such terms shall be incorporated verbatim or be deemed incorporated by the reference in any such Bill of Lading. In such sub-paragraphs and in any Act referred to therein, the word "carrier" shall include the Owner and the Chartered Owner of the Vessel.

(i) CLAUSE PARAMOUNT. This Bill of Lading shall have effect subject to the provisions of the Carriage of Goods by Sea Acts of the United States, approved April 16, 1936, except that if this Bill of Lading is issued at a place where any other Act, ordinance or legislation gives statutory effect to the International Convention for the Unification of Certain Rules relating to Bills of Lading at Brussels, August 1924, then this Bill of Lading shall have effect, subject to the provisions of such Act, ordinance or legislation. The applicable Act, ordinance or legislation (hereinafter called the "Act") shall be deemed to be incorporated herein and nothing herein contained shall be deemed a surrender by the Owner of any of its rights or immunities or an increase of any of its responsibilities or liabilities under the Act. If any term of this Bill of L ng be repugnant to the Act to any extent, such term shall be void to the extent but no f

(ii) JASON CLAUSE. In the event of accident, danger, damage or disaster before or r the commencement of the voyage, resulting from any cause whatsoever, whether due to negligence or not, for which, or for the consequence of which, the Owner is not responsible, by statute contract or otherwise, the cargo shippers, consignees or owners of the cargo shall contribute with the Owner in General Average to the payment of any sacrifices, losses or expenses of a General Average nature that may be made or incurred and shall pay salvage and special charges incurred in respect of the cargo. If a salving ship is owned or operated by the Owner, salvage shall be paid for as fully as if the said salving ship or ships belonged to strangers. Such deposit as the Owner or his agents may deem sufficient to cover the estimated contribution of the cargo and any salvage and special charges thereon shall, if required, be made by the cargo, shippers, consignees or owners of the cargo to the carrier before delivery.

(iii) GENERAL AVERAGE. General Average shall be adjusted, stated and settled according to York/Antwerp Rules 1950 and, as to matters not provided for by those rules, according to the laws and usages at the port of New York or at the port of London, whichever place specified in Part I of this Charter. If a General Average statement is required, it sha prepared at such port or place in the United States or United Kingdom, whichever count specified in Part I of this Charter, as may be selected by the Owner, unless otherwise mutu agreed, by an Adjuster appointed by the Owner and approved by the Charterer. Such Adjuster shall attend to the settlement and the collection of the General Average, subject to customary charges. General Average Agreements and/or security shall be furnished by Owner and/or Charterer, and/or Owner and/or Consignee of cargo, if requested. Any cash deposit being made as security to pay General Average and/or salvage shall be remitted to the Average Adjuster and shall be held by him at his risk in a special account in a duly authorized and licensed bank at the place where the General Average statement is prepared.

(iv) BOTH TO BLAME. If the Vessel comes into collision with another ship as a result of the negligence of the other ship and any act, neglect or default of the Master, mariner, pilot or the servants of the Owner in the navigation or in the management of the Vessel, the owners of the cargo carried hereunder shall indemnify the Owner against all loss or liability to the other or non-carrying ship or her owners in so far as such loss or liability represents loss of, or damage to, or any claim whatsoever of the owners of said cargo, paid or payable by the other or recovered by the other or non-carrying ship or her owners as part of their claim against the carrying ship or Owner. The foregoing provisions shall also apply where the owners, operators or those in charge of any ships or objects other than, or in addition to, the colliding ships or object are at fault in respect of a collision or contact.

(v) LIMITATION OF LIABILITY. Any provision of this Charter to the contrary notwithstanding, the Owner shall have the benefit of all limitations of, and exemptions from, liability accorded to the owner or chartered owner of vessels by any statute or rule of law for th ne being in force.

(vi) WAR RISKS. (a) If any port of loading or of discharge named in this Charter , city or to which the Vessel may properly be ordered pursuant to the terms of the Bills of Lading be blockaded, or

(b) If owing to any war, hostilities, warlike operations, civil war, civil commotions, revolutions or the operation of international law (a) entry to any such port of loading or of discharge or the loading or discharge of cargo at any such port be considered by the Master or Owners in his or their discretion dangerous or prohibited or (b) it be considered by the Master or Owners in his or their discretion dangerous or impossible for the Vessel to reach any such port of loading or discharge—the Charterers shall have the right to order the cargo or such part of it as may be affected to be loaded or discharged at any other safe port of loading or of discharge within the range of loading or discharging ports respectively established under the provisions of the Charter Party (provided such other port is not blockaded or that entry thereto or loading or discharge of cargo thereat is not in the Master's or Owner's discretion dangerous or prohibited). If in respect of a port of discharge no orders be received from the Charterers within 48 hours after they or their agents have received from the Owners a request for the nomination of a substitute port, the Owners shall then be at liberty to discharge the cargo at any safe port which they or the Master may in their or his discretion decide on (whether within the range of discharging ports established under the provisions of the Charter Party or not) and such discharge shall be deemed to be due fulfillment of the contract or contracts of affreightment so far as cargo so discharged is concerned. In the event of the cargo being loaded or discharged at any such other port within the respective range of loading or discharging ports established under the provisions of the Charter Party, the Charter Party shall be read in respect of freight and all other conditions whatsoever as if the voyage performed were that originally designated. In the event, however, that the Vessel discharges the cargo at a port outside the range of discharging ports established under the provisions of the Charter Party, freight shall be paid as for the voyage originally designated and all extra expenses involved in reaching the actual port of discharge and or discharging the cargo thereat shall be paid by the Charterers or Cargo Owners In the latter event the Owners shall have a lien on the cargo for all such extra expenses.

(c) The Vessel shall have liberty to comply with any directions or recommendations, departure, arrival, routes, ports of call, stoppages, destinations, zones, waters, delivery or otherwise whatsoever given by the government of the nations under whose flag the Vessel or any other government or local authority including any de facto government or local auth or by any person or body acting or purporting to act as or with the authority of any such government or authority or by any committee or person having under the terms of the war risks insurance on the vessel the right to give any such directions or recommendations. If by reason of or in compliance with any such directions or recommendations, anything is done or is not done such shall not be deemed a deviation.

If by reason of or in compliance with any such direction or recommendation the Vessel does not proceed to the port or ports of discharge originally designated or to which she may have been ordered pursuant to the terms of the Bills of Lading, the Vessel may proceed to any safe port of discharge which the Master or Owners in his or their discretion may decide on and there discharge the cargo. Such discharge shall be deemed to be due fulfillment of the contract or contracts of affreightment and the Owners shall be entitled to freight as if discharge has been effected at the port or ports originally designated or to which the vessel may have been ordered

free of charges for the use of any wharf, dock, place or mooring facility arranged by the Charterer for the purpose of loading or discharging cargo; however, the Owner shall be responsible for charges for such berth when used solely for Vessel's purposes, such as awaiting Owner's orders, tank cleaning, repairs, etc. before, during or after loading or discharging.

13. (a) CARGOES EXCLUDED VAPOR PRESSURE. Cargo shall not be shipped which a vapor pressure at one hundred degrees Fahrenheit (100°F) in excess of thirteen and half pounds (13.5 lbs.) as determined by the current A.S.T.M. Method Rule D-323.

(b) FLASH POINT. Cargo having a flash point under one hundred and fifteen degrees Fahrenheit (115°F) (closed cup) A.S.T.M. Method D-56 shall not be loaded from lighters but this clause shall not restrict the Charterer from loading or topping off Crude Oil from vessels or barges inside or outside the bar at any port or place where bar conditions exist.

14. (a) ICE. In case port of loading or discharge should be inaccessible owing to ice, the Vessel shall direct her course according to Master's judgment, notifying by telegraph or radio, if available, the Charterers, shipper or consignee, who is bound to telegraph or radio orders for another port, which is free from ice and where there are facilities for the loading or reception of the cargo in bulk. The whole of the time occupied from the time the Vessel is diverted by reason of the ice until her arrival at an ice-free port of loading or discharge, as the case may be, shall be paid for by the Charterer at the demurrage rate stipulated in Part I.

(b) If on account of ice the Master considers it dangerous to enter or remain at any loading or discharging place for fear of the Vessel being frozen in or damaged, the Master shall communicate by telegraph or radio, if available, with the Charterer, shipper or consignee of the cargo, who shall telegraph or radio him in reply, giving orders to proceed to another port as per Clause 14(a) where there is no danger of ice and where there are the necessary facilities for the loading or reception of the cargo in bulk, or to remain at the original port at their risk, and in either case Charterer to pay for the time that the Vessel may be delayed, at the demurrage rate stipulated in Part I.

15. TWO OR MORE PORTS COUNTING AS ONE. To the extent that the freight rate standard of reference specified in Part I F hereof provides for special groupings or combinations of ports or terminals, any two or more ports or terminals within each such grouping or combination shall count as one port for purposes of calculating freight and demurrage only, subject to the following conditions.

(a) Charterer shall pay freight at the highest rate payable under Part I F hereof for a voyage between the loading and discharge ports used by Charterer.

(b) All charges normally incurred by reason of using more than one berth shall be for Charterer's account as provided in Clause 9 hereof.

(c) Time consumed shifting between the ports or terminals within the particular grouping or combination shall not count as used laytime.

(d) Time consumed shifting between berths within one of the ports or terminals of the particular grouping or combination shall count as used laytime.

16. GENERAL CARGO. The Charterer shall not be permitted to ship any packaged goods or non-liquid bulk cargo of any description, the cargo the Vessel is to load under this Charter is to consist only of liquid bulk cargo as specified in Clause 1.

17. (a) QUARANTINE. Should the Charterer send the Vessel to any port or place where quarantine exists, any delay thereby caused to the Vessel shall count as used laytime, but should the quarantine not be declared until the Vessel is on passage to such port, the Charterer shall not be liable for any resulting delay.

(b) FUMIGATION. If the Vessel, prior to or after entering upon this Charter, has docked at docks at any wharf which is not rat-free or stegomyia-free, she shall, before proceeding to a rat-free or stegomyia-free wharf, be fumigated by the Owner at his expense, except that if the Charterer ordered the Vessel to an infected wharf the Charterer shall bear the expense of fumigation.

18. CLEANING. The Owner shall clean the tanks, pipes and pumps of the Vessel to the satisfaction of the Charterer's Inspector. The Vessel shall not be responsible for any admixture if more than one quality of oil is shipped, nor for leakage, contamination or deterioration in quality of the cargo unless the admixture, leakage, contamination or deterioration results from (a) unseaworthiness existing at the time of loading or at the inception of the voyage which was discoverable by the exercise of due diligence, or (b) error or fault of the servants of the Owner in the loading, care or discharge of the cargo.

19. GENERAL EXCEPTIONS CLAUSE. The Vessel, her Master and Owner shall not, unless otherwise in this Charter expressly provided, be responsible for any loss or damage, or delay or failure in performing hereunder, arising or resulting from:—any act, neglect, default order, to sail with or without pilots, to tow or to be towed, to go to the assistance of vessels in distress, to deviate for the purpose of saving life or property or of landing any ill or injured person on board, and to call for fuel at any port or ports in or out of the regular course of the voyage. Any salvage shall be for the sole benefit of the Owner.

21. LIEN. The Owner shall have an absolute lien on the cargo for all freight, deadfreight, demurrage and costs, including attorney fees, of recovering the same, which lien shall continue after delivery of the cargo into the possession of the Charterer or of the holders of any Bills of Lading covering the same or of any storageman.

22. AGENTS. The Owner shall appoint Vessel's agents at all ports.

23. BREACH. Damages for breach of this Charter shall include all provable damages and all costs of suit and attorney fees incurred in any action hereunder.

24. ARBITRATION. Any and all differences and disputes of whatsoever nature arising out of this Charter shall be put to arbitration in the City of New York or in the City of London whichever place is specified in Part I of this charter pursuant to the laws relating to arbitration there in force, before a board of three persons, consisting of one arbitrator to be appointed by Owner, one by the Charterer, and one by the two so chosen. The decision of any two of the three on any point or points shall be final. Either party hereto may call for such arbitration by serving upon any officer of the other, wherever he may be found, of a written notice specifying the name and address of the arbitrator chosen by the first moving party and a brief description of the disputes or differences which such party desires to put to arbitration. If the other party shall, by notice served upon an officer of the first moving party within twenty days of the service of such first notice, appoint its arbitrator to arbitrate the dispute or differences specified, the first moving party shall have the right without further notice to appoint a second arbitrator who shall be a disinterested person with precisely the same force and effect as if said second arbitrator has been appointed by the other party. In the event that the two arbitrators fail to appoint a third arbitrator within twenty days of the appointment of the second arbitrator, either arbitrator may apply to a Judge of any court of maritime jurisdiction in the city above mentioned for the appointment of a third arbitrator, and the appointment of such arbitrator by such Judge on such application shall have precisely the same force and effect as if such arbitrator had been appointed by the two arbitrators. Until such time as the arbitrators finally close the hearings either party shall have the right by written notice served on the arbitrators and on officer of the other party to specify further disputes or differences under this Charter for adjudication and determination. Awards made in pursuance to this clause may include costs, including a reasonable allowance for attorney's fees, and judgement may be entered upon any award made hereunder in any Court having jurisdiction in the premises.

25. SUBLET. Charterer shall have the right to sublet the Vessel. However, Charterer shall always remain responsible for the fulfillment of this Charter in all its terms and conditions.

26. OIL POLLUTION CLAUSE. Owner agrees to participate in Charterer's program covering oil pollution avoidance. Such program prohibits discharge overboard of all oily water, oily ballast or oil in any form of a persistent nature, except under extreme circumstances whereby the safety of the vessel, cargo or life at sea would be imperiled.

Upon notice being given to the Owner that Oil Pollution Avoidance controls are required, the Owner will instruct the Master to retain on board the vessel all oily residues from combined tank washings, dirty ballast, etc., in one compartment, after separation of all but water has taken place. All water separated to be discharged overboard.

If the Charterer requires that demulsifiers shall be used for the separation of oil and water such demulsifiers shall be obtained by the Owner and paid for by Charterer.

The oil residues will be pumped ashore at the loading or discharging terminal, either segregated oil, dirty ballast or co-mingled with cargo as it is possible for Charterers to arrange. If it is necessary to retain the residue on board co-mingled with or segregated from the cargo to be loaded, Charterers shall pay for any deadfreight so incurred.

Should it be determined that the residue is to be co-mingled or segregated on board the Master shall arrange that the quantity of tank washings be measured in conjunction with a surveyor and a note of the quantity measured made in the vessel's ullage record.

The Charterer agrees to pay freight as per the terms of the Charter Party on combined or consolidated tank washings, dirty ballast, etc., retained on board under Charterer's instructions during the loaded portion of the voyage up to a maximum of 1% of the total deadweight of the vessel that could be legally carried for such voyage. Any extra expenses incurred by the vessel at loading or discharging port in pumping ashore oil residues shall be for Charterer's account and extra time, if any, consumed for this operation shall count as used laytime.

BILL OF LADING

Shipped in apparent good order and condition by _____

on board the _____ Steamship / Motorship _____

whereof _____ is Master, at the port of _____

_____

_____

_____

_____

_____

_____

to be delivered at the port of _____

or so near thereto as the Vessel can safely get, always afloat, unto _____

_____

or order on payment of freight at the rate of _____

_____

This shipment is carried under and pursuant to the terms of the charter / contract dated New York, London _____

between _____ and _____, as Charterer, and all the terms whatsoever of the said charter / contract except the rate and payment of freight specified therein apply to and govern the rights of the parties concerned in this shipment.

In witness whereof the Master has signed _____ Bills of Lading of this tenor and date, one of which being accomplished, the others will be void.

Dated at _____ this _____ day of _____

_____

Master

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THE ROLE OF THE SHIPBROKER

AND

ADVANTAGEOUS FREIGHT UTILIZATION

PREPARED BY

Peter J. Goddard, Managing Director,
Goddard Osborn Tankers Ltd.

Introduction

Chartering of Tankers

Tankers are chartered or hired by cargo owners from ship owners in several basic ways.

Single Voyage

Where a specified vessel performs a voyage between two specified areas.

Consecutive Voyage Charter

This is where a specified vessel performs either a fixed number of voyages between two areas or performs voyages for a specified period on a worldwide basis.

Time Charter

This is where the owner hires out the complete use of his vessel, crew and operating expertise on a dollar per deadweight ton per month basis. Normally, the vessel may trade worldwide with some exclusions which are often political, but also sometimes physical, e.g. not in ice-bound areas. The length of time can vary between a few months to ten years, and provision is often made for rate changes during the period of the charter.

The main difference between Consecutive Voyages and Time Charter is that speed of the vessel and consumption of fuel at that speed is guaranteed by the owner of the Time Chartered vessel, and the Charterer supplies and pays for that fuel. The Charterer also pays directly for port costs incurred, and is able to ensure that they are kept to a minimum. The main disadvantage against Consecutive Voyages is that staff are required to carry out the administration of a Time Charter.

Contract of Affreightment

This is where an owner contracts to carry an amount of cargo over a given period at a specified rate between two specific areas, but not necessarily on the same ship. It provides some rate security for the Charterer over the period, and lifting flexibility, without requiring a shipping department with its own expertise. Contracts of Affreightment are useful to cover a situation where the alternative for the Oil Company would be owning vessels which would not get maximum utilization, or alternatively chartering where the quantity and voyage time would not warrant a vessel on Consecutive Voyages or Time Charter.

Tonnage Exchange

This takes place between major Oil Companies, who own tankers and allow each other to use their vessels to perform a specific voyage. No payment is made, but the value of each voyage performed is calculated on the amount of cargo carried and the

number of days it takes to perform the voyage. This is an exchange, and as payment is not made, it is necessary to frequently redress any imbalance.

Each of the foregoing require a legal agreement or contract, which is known as a Charter Party, which would be drawn up showing all the details agreed, and signed by both parties. Various standard forms are in existence, and some examples are attached.

In drawing up the Charter Party, in all except the Tonnage Exchange and the Time Charter, a rate has to be agreed and included. I will briefly explain how this is achieved when a voyage is not specified, but the freight is predetermined by reference to a fixed scale of rates.

To explain the history of "rates", one goes back to the 1939 - 1945 war when Governments requisitioned tankers and compensated the owners on a Time Charter basis. Frequently, these tankers were chartered out in turn to Oil Companies on a voyage basis and to establish the rate for a voyage, both the British Ministry of Transport and the U.S. Maritime Commission devised schedules of freight rates known as MOT Scale and USMC Scale respectively. Between 1952 and 1962, a number of different schedules were issued - 1, 2, 3 and Intascale in London, and ATRS in New York. Then, in 1969, a joint publication, "Worldscale", was introduced to replace both Intascale and

ATRS. With "Worldscale" it became the practice to express rates as a percentage of the published figure. In 1989 "Worldscale" was superseded by "New Worldscale" which has increased the size of the "Standard Vessel" used in the calculations and rates apply to a metric tonne rather than a long ton. These changes reflect the constant attempt by the compilers to keep in touch with current trends.

Having briefly explained how we got "New Worldscale", which stands for "New Worldwide Tanker Nominal Freight Scale", you might say that 1945 is long gone, so why do we need it? The answer comes from the flexibility demanded by Charterers who do not wish, or are not able to disclose the actual port or ports of loading and discharge within the areas agreed in the Charter Parties at the time of Charter. The Nominal Freight Scale represents a bench mark or reference point, for which a rate can be calculated by computer by an independent third party, for any voyage performed, by any vessel to any ports or place into which the "standard vessel" can go. The "New Worldscale" standard vessel has a rate of hire, deadweight, gross tonnage, Suez/Panama Canal tonnage, a length beam draft and a speed and consumption, which enable a cost for performing any voyage to be ascertained. By applying the cargo carrying capacity to this cost, a per tonne rate for the voyage can be calculated, I emphasize the word voyage, because under "New Worldscale", a

voyage is considered to be from loading port via discharge port or port(s) and back to first loading port. "New Worldscale" is updated annually to take account of changing bunker prices and port charges.

"New Worldscale" has now officially changed its name and is called "Worldscale". The first section of the "Worldscale" book explains the method of calculation, and lists differentials that apply to some rates under certain conditions. The bulk of the book contains rates listed under the discharge ports in alphabetical order, the discharge port or ports are in heavy type and under these headings are found various loading ports with the rate in US Dollars at "Worldscale" 100 alongside and the round trip distance alongside that.

Because of this standard calculation, it is possible for an owner to agree a rate of "Worldscale" for a voyage from, say, any port in the Arabian Gulf to any port in Australia, and expect the same daily rate of return on his vessel, whichever actual ports were involved; if he had a "standard" vessel it might be true, but for the purposes of agreeing areas to areas, no better solution has been found.

The "Worldscale" schedule includes a number of stipulations specifying which costs have been included in their calculation and are, therefore, for owners' accounts and those that are not and, therefore, for charterer's account. This can be a contentious point, and the chartering expression, "Worldscale Terms and Conditions" is usually included in a Charter Party in order to embrace these points.

Time is an important factor in all these calculations, but is the one factor traders are most guilty of ignoring. I use the word "time", although the time I am referring to is called demurrage in the industry - I will explain:

When an owner charters out his ship to perform a voyage, i.e. carry a cargo from A to B, he agrees to allow the charterer a certain amount of time to perform his operations, which are basically loading and discharging. This allowed time is called laytime - the time that the charterer uses which exceeds this laytime, is demurrage.

Demurrage payment is important to an owner because "Worldscale" have only provided for a standard amount of laytime within their calculation. They have, however, provided demurrage scale covering vessels from 15,000 to 500,000 tonnes SDWT, and this can easily be applied to a charter by either agreeing the same percentage as for the rate, or some different percentage, or more usually these days a dollar rate. For some reason, traders seem to regard demurrage as a penalty or fine, and are very reluctant to pay it; the only explanation I have found for this is that they do not, or cannot back to back their contracts.

Charter Party laytime is reversible, which means that it can be used either at loadport or discharge port, and the total time used is charged against the total allowed, normally 72 hours.

However, once all the laytime has been used up, the six hour Notice Of Readiness (NOR) time is not allowed - nor any other allowances, for 'once on demurrage, always on demurrage'. The trader usually has at least two contracts, one buying and one selling, for which he splits his reversible laytime and allows half to each, plus six hours' NOR time. It is easy to see the exposure on each occasion, which I suspect is not always allowed for.

As well as all the standard clauses required for the carriage of goods by sea and shipowner's warranty to perform, the Charter will include special clauses that a particular charterer requires, or that he feels are prudent in the light of current political situations and specific geographical ones which come from experience. The owner will similarly try to include clauses to protect his position.

Having covered most of the features of chartering, we will mention Average Freight Assessment or AFRA, which provides a rate structure and is calculated by averaging the cost of all the Oil Company owned vessels, period chartered vessels and voyage chartered vessels which are in effect at a given time, and is calculated for six different deadweight groups as follows:

General Purposes	16,500 - 24,999
Medium Range	25,000 - 44,999
Large Range 1	50,000 - 79,999
2	80,000 - 159,999
VLCC	160,000 - 319,999
ULCC	320,000 - 549,999

It is calculated each month, but the figures are no longer made public - only to subscribers who agree not to pass the information to non-subscribers, and is mainly for the benefit of Oil Companies who use it for freighting costs to their subsidiaries, and its acceptability by the fiscal authorities through the world as an arm's length price for intercompany trading is its major attraction. It is also used by some companies in calculating ton day balances for Tonnage Exchange, instead of WS 100.

The Broker

Major Oil Companies have not in the past fully utilized shipbrokers, because their criteria for chartering have not been those in which a broker could be of much assistance. The Majors have flexibility in shipping and cargoes, by virtue of their own vessels and their ownership of crude oil and downstream operations. Dramatic increases in costs could be passed through to the consumer, e.g. the surcharge on gasoline for the closure of Suez (which was never removed), but minor savings on freight has not been as important as obtaining uniformity of

advantageous freight utilization will not change, even if the user does.

It should be noted that as Major Oil Companies have reorganised their trading operations so also have they moved to try to take advantage of shipping opportunities that previously they had ignored. It is remarkable to note that in many instances the Trading remains separated from the Shipping department which inhibits the creative and most advantageous ways of utilising shipping to enhance the overall flexibility and ultimate profitability of the enterprise.

Whilst the oil markets employ most of the modern techniques of risk management no really suitable future market has yet emerged in shipping, nevertheless Charterers seem reluctant in many cases to view the opportunity to fix vessels on a period basis as a hedge against freight fluctuations. Charterers should not consider tonnage to be surplus if it is not carrying their own cargo provided the vessel is carrying cargoes in basically the same market as they are having to charter in.

Over the next few years we may well see Oil Companies who have gone from a long position in tonnage to a short position wishing they had stayed "hedged" realising that if one is involved in international business, transportation will always be a factor to consider.

terms and conditions to facilitate operations and accounting. In anything except a crisis, quality of tonnage, dependability and experience with the owners were far more important to the Major Oil Companies.

Their own well staffed shipping and chartering departments seldom make the decision to charter or let out; they merely respond to fulfil the requirements of the oil programme. The chartering department would seldom be in a position to put up more commercial alternatives, as they are often remote from the dealings which create the oil programme.

The dramatic changes since the mid 70's left all major Oil Companies with surplus shipping capacity, and they have yet to emerge fully from the role as owners rather than charterers.

During these years it was the Trader who had been able to fully utilize the shipbroker, and obtain advantageous freight utilization, because he has been motivated and in touch with all three of his important markets - oil, money and shipping. His success reflected his ability to judge the situation correctly, having evaluated the information fed to him via the brokers in each market. Inevitably, as the trading companies have grown in size, the individual trader's grasp of his markets has receded a little, and the oil side is tending to become remote from the shipping. Nevertheless, the role of the shipbroker and

advantageous freight utilization will not change, even if the user does.

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With today's 'transparent' pricing of Crude and Products there are clearly opportunities for those who can achieve transportation at levels below the apparent market levels.

There are four areas that a shipbroker must provide his service in, but for the relationship to have any value, I would stress that both parties would need absolute confidence that the private information by either remained confidential.

The key areas are:

1. Market information and trends.
2. Spotting business opportunities.
3. Ability to negotiate and conclude a fixture properly.
4. Following the operation of the vessel to conclusion.

We will expand a little on each:

Market Information and Trends

A broker will need to have worldwide information in all trades because some traders will follow up opportunities worldwide, whereas others will specialize on particular sectors based on product type or geographical location, as responsibilities within a team are divided. The trader will be interested in what the competition is doing, and the broker will tread a very delicate path where he has private information about the activities of another trader which could affect a particular market. The trader is a busy person, and would not want an exhaustive report on all trades, but will want a quick summary

and rate forecast in a particular area in which he may be trying to put together a deal. The report would be expected to include details of deals concluded, availability of tonnage, other requirements for tonnage in that area and the broker's projection of the rate for a particular voyage for a position in the future - from the next day to, say, three weeks ahead. All this would need to be thorough and accurate; and it is unlikely that a serious trader would continue to use a broker whose track record was not higher than 95% accurate. The broker would tell the trader if he felt the balance of supply and demand for ships in a particular area was changing, and by how much this might affect the rate, as a trader might be able to reschedule a deal to await a drop, or avoid a rise in rate, by moving quickly to secure tonnage.

We have seen that "Worldscale" is based on loaded and ballast legs of a voyage; it is obvious that if an owner can reduce the ballast leg, his earnings will improve, and it is the broker who should be aware of vessels discharging in traders' loading areas, so that the trader can share some of the owner's benefit. The broker should be aware of vessels that have forward commitment, either in time or area, so that the trader can take advantage of the cost of freight, even if in doing so the flexibility is diminished (contract/dry dock/Oil Company/ selling, etc). One should be aware that the owners are not simpletons, and it is unlikely that the most advantageous

freight can be achieved without giving up some benefit, be it flexibility or merely part of the overall gain.

It is desirable that a trader has the maximum flexibility of places to load and discharge, and thus asks for options to load at one or more ports and discharge at one or more ports in his option. However, in a poor market when rates are low, an owner may feel he is not adequately compensated in the "Worldscale" rate for his vessel's costs in port. He will, therefore, do his best to negotiate the minimum port calls, and try to restrict a charterer's option to one port. Where a trader has a locked-in requirement to perform a short voyage that tonnage is asking a high rate for, would the owner perform the short voyage at a lower rate if a second voyage was agreed to follow? Can the trader use the second voyage himself, or perhaps the broker is confident enough that the vessel could be re-let in that position to others at break-even, or better?

In a predicted or actual market, should a trader take a vessel for two consecutive voyages?

Should the trader take a vessel on time charter because the broker feels sure that surplus time could be re-let on a voyage basis, which would help to subsidise the trader's own use?

All these questions should have answers that the broker can discuss with the trader, to help him make the decision that may

reduce the rate in the short-term, but may inhibit flexibility or make a commitment for an uncertain future.

As you see, the possibilities are endless, but when the oil deal needs 'all round the world' option for discharge because of the uncertainty of the sales possibilities and degree of overall flexibility required, it is not surprising that the major Oil Companies bought their own ships.

Spotting Business Opportunities

A shipbroker who works closely with a trader would be expected to be aware of the product prices and values in rough terms. It is quite normal that he would know that a trader was trying to supply a product to Australia, for instance, and being aware of the freight rates from the various supply ports, the shipbroker may know of a ship in an unlikely or high priced supply area that would show such a low rate to Australia that outweighs the difference in product price. Also a broker may see a charterer take a vessel to perform an unusual voyage, which can indicate a trading route not considered before, but has arisen from a unique set of circumstances.

There are an infinite number of possibilities that can arise, and it is for the brokers to be well enough acquainted with the principals' aims to be able to propose them if and when they are seen.

Concluding a Fixture

The ability to negotiate and conclude a fixture properly may seem a vey obvious requirement, but all too often the 'broker' has only experience in a charterer's market, and performs only with the strength of the charterer, and lacks objectivity. This frequently leads to a situation where the negotiation becomes a battle of bluster, threat and downright lies, whereas instead a broker should be undermining the hardline subjective view of his two principals with a reasonable, objective standpoint that only he can have. Where the reasonable compromise that is workable leaves both principals content, it augers well for a proper performance by both parties. Human nature dictates that the party 'done down' will seek revenge, and often takes the form of non co-operation, which can result in the whole purpose of the venture being frustrated. It is an important role of the broker to avoid these situations.

It should be noted that it is the shipowner, and not the charterer, who pays the broker - normally, one and quarter percent of the freight earned for the voyage, but it is important to the owner that brokers have close relationships with charterers to provide work for the vessels.

All charterers will have a standard set of terms compiled during their experience, or passed on by a broker from another's experience of changing laws, political affiliations, oil

pollution, age of vessels, new technology and attitudes to flags of convenience, etc. From a trader's point of view, these matters can be critical, particularly where installations are owned by large Oil Companies that are very conscious of protecting their public image, and will exclude vessels that have a poor performance record, or appear to be accident prone. Where formerly 'black-lists' were published by the Arab League (Israeli traders) and the U.S. State Department (Cuba traders), it was easy to avoid such vessels, but nowadays, with the dangers of libel suits, most lists of this type are kept very private, and Companies rejecting tonnage are reluctant to give their reasons.

A computerised Marine Data record has been established, which records all accidents to tankers, and is used by major Companies to evaluate tonnage, but the data is not readily available, though it can often be checked out via circuitous routes. In most cases, brokers will be aware of the track record of tonnage, and be able to steer charterers away from suspect vessels.

Labour organisations, such as the International Transport Worker's Federation (ITF), are very strong in some areas, such as Australia and Scandinavia, and it would be unwise for both owner and charterer to include the option of loading and discharging in these areas to a ship not entered in this organisation, or an affiliated or acceptable alternative. This

matter would be covered by a prudent charterer during negotiations, and included along with other additions to the standard Charter Party.

These terms would be added to a standard Charter Party. A trader would usually base his terms on the Charter Party most acceptable to the trade in general, which is currently the Asbatankvoy. This Charter Party, previously known as Exxonvoy, was originally based on the "Warshipoilvoy", which was an evenhanded agreement devised to be acceptable to both Oil Companies and shipowners. The trader would be interested mainly in the rate, size and position, and being busy with other things, would expect his broker to be able to exchange offers within his authority and on his terms without them being spelt out to him on each occasion. Decisions to give in or not on terms, would require renewed authority from the charterer.

It is essential that brokers keep a record in writing of exchanges of this nature, and a typical broker's offer form is included with these notes. On conclusion of a deal, it is normal to initially telex both parties the understood terms agreed, which should properly represent the negotiation; thereafter a Charter Party would be prepared for signature.

Following the Operation of the Vessel

After the fixture is concluded, the operational side takes over, and voyage orders are passed via the broker to the owner, and information regarding the position and progress of the vessel is

fed back to the charterer and finally discharge orders are issued and freight is invoiced, via the broker, for the voyage performed. Then demurrage and deviation claims, etc, follow a little later as they are compiled by the owners, after receiving information from the ship.

In the last area, the skills of a broker are often tried to their full, as one party will often want the other to perform in a particular way that was not agreed at the outset, or perhaps to extend their options for discharge. It is at this time one hopes that the fixture was concluded with reasonable accord. It is sad to recall the thousands of hours wasted over the last few years arguing whether a ship should be obliged to discharge its cargo, without the receiver presenting his Bill of Lading; at last it would seem that it has been accepted that the Bill of Lading is a shipping document, and shows entitlement to the cargo, or part of it, and was not intended only for the use of bankers to protect their interests. It is now accepted that an owner is entitled to be indemnified against risks involving the Bill of Lading and signed by charterers, and guaranteed by their bank now. A reasonably standard form of Indemnity stated in the Bill of Lading or for the receipt of cargoes by receivers without a Bill of Lading which Indemnity does not put the owners at risk to the value of the cargo.

Other difficulties of this magnitude are bound to arise, and it is hoped that they will be resolved with a sensible attitude that can view both sides of the problem. One hopes that brokers will assist to this end.

Section 10

Price Formation and Reporting

DAILY OIL PRICE REPORTS

Name

PLATTS

Oilgram News

Marketscan (products)

Crude Oil Marketwire

Tanker Wire

PETROLEUM ARGUS

Argus Crude

Argus Atlantic Products

Crude & Atlantic Products

Asian Products

US Products

LONDON OIL REPORTS

Crude

Products

REUTER PIPELINE (Crude & Products)

ALSO

Petroflash (US only)

Oil Price Information Service (US only)

RIM (Asian Crude and Product Prices)

APPI (Asia only)

BASIC GUIDE TO OIL PRICE REPORTING SERVICES

By : P S Williams
Date : April 1987

There are two possible ways of categorising oil price reporting services.

(i) By the method of collecting data
(ii) By the frequency with which the data is published

(i) Method of Collection

Almost all oil price reporting services collect data in a similar way. This is, they telephone a selection of oil traders, oil brokers, oil majors, independent refiners etc and ask them (a) what deals have they heard done on the market and, (b) where they would assess the current market range. Most oil price reporters are also interested in which factors are moving prices up or down. This method is followed broadly by all the major services.

So far the only report to have broken this pattern is The Asian Petroleum Price Index (APPI) run by Roger Osborne in Hong Kong. This asks a rotating panel of oil marketers to give their assessment on a regular basis of the market range for crude and products. These assessments are then, using a complicated averaging formula, topped and tailed and the results printed.

Poten & Partners, a large U.S. oil broking firm, announced last year it would be establishing a similar index for crude and products worldwide but, so far, this has not appeared.

(ii) Frequency of Publication

This is the more usual way of sub-dividing the oil reporting services. They fall naturally into three categories:-

(a) On-line "real-time" reports
(b) Daily reports - usually telex or electronic mail
(c) Weekly printed reports

(a) The on-line services

The two main screen-based services are:-

The Reuter Monitor Oil Service
The Telerate Energy Service

Both provide spot oil quotes worldwide, oil news, statistical data, and third party contributors.

18N

(c) **Weekly Printed Reports:**

These are exceedingly numerous. The most significant are:

Petroleum Intelligence Weekly
Weekly Petroleum Argus (formerly Europ-Oil Prices)
The Barrel (formerly London Oil Reports)

Strictly speaking PIW is not an oil price report but it contains a significant amount of oil price commentary.

Weekly Petroleum Argus is intended to "flesh out" the picture behind the daily price reports. As well as commentary it contains a wide range of statistical data.

The Barrel is published by the ICIS-LOR group and contains commentary and statistical data on the international spot markets.

Additional Services

Almost all the above mentioned companies offer their statistics in some kind of graphical form.

In addition their is a "hybrid" service called EMIS (Electronic Markets & Information Services). This is a joint venture between McGraw-Hill and Citibank which, in one package, gives you access to all the Platts services plus a number of the other leading services (Argus, LOR).

SPOT MARKETS

If term supplies dominate supplies volumetrically, spot prices dominate the processes of price formation, and for good reason. The spot market is both a marginal irritant to the mainstream of the business and central to price formation, with impeccable economic logic, precisely *because* it is marginal: it represents the opportunity cost of buying or selling.

It was not always so. In the days of vertical organization, companies used cost minimization as their decision criterion in refinery operation and paid no attention to spot prices. When the vertical structure of the industry was destroyed, the newly-exposed players in the market found themselves evaluating their buying and selling needs against alternatives at every stage of the production process. This "make of buy" criterion has drawn spot prices into all parts of the industry. In the circumstances, the development of the spot market and its usurpation of the central role in price leadership was inevitable. The process by which it occurred is one of the main themes in this paper.

That such a market, whose economic role is of balancing at the margin should take a central role seems, to many, quite simply wrong: "The tail wagging the dog..." But it is axiomatic that the marginal nature of a market does not diminish its importance in price formation.[1]

Spot markets perform a balancing role at the margin of supply. Companies with short-term surpluses or deficits can go to the spot market to deal with them. The trade is one-off, single transactions between unrelated parties (etc) and with no contractual commitment for further supplies. The transactions can be of any sort, e.g. size, quality and method of delivery, to suit the parties. Prices are agreed at the time of the transaction[2], determined by two sorts of data: the market for the goods in question and the interaction of price-determining variables.

However, the spot market for oil has had a curious history. From being marginal in volumetric terms less than 1 per cent of the international crude trade before 1979 - it went to being highly significant, peaking at between one-third and one-half in 1983-1984, and then dropped back again. (Such numbers are offered for illustrative purposes only. There is no way of knowing what the volumes in these unrecorded markets are, apart from some brief flashes provided by special exercises mounted by the IEA (1980-1986) and the European Commission (1978-1980). If it is "unnatural" in an industry like oil that a large proportion of trade should be supplied by the spot market, it is possible to see the ballooning of spot volumes as a bridge between the two sorts of term markets: from administered to market-related pricing.

An important point, since this distinguishes the "real" prices generated in the spot market from price-linked transactions - determined by formulate at the time of lifting. This, although traditional, has become a somewhat theoretical point of definition since it is no longer possible to say that spot deals are done at prices negotiated at the time; many spot deals are done at prices linked to marker grades, or to futures prices. We doubt that a large proportion of spot deals are price-linked, but it is not possible to be sure since there are no data.

This calls for some explanation, but it might help if we first looked at the prices reported from the spot markets.

The Meaning of Spot Prices

Spot prices are quoted in the trade press: Platts, Argus, London Oil Reports and many more produce daily reports in the main trading centers. Prices are also reported during the day by the screen services (Reuters, Telerate) and less frequently by other papers (PIW and Platts Weekly). In the general press, when "Brent" prices - or even just "Crude Prices" - are referred to, they will almost always by the spot price. Published prices for crude are always FOB, which is to say at the port of loading.

Product markets are also discussed in terms of spot prices. (We shall discuss the tricky problem of crude and product forward markets, which rest between spot and futures, in the next chapter). They have a different structure, being priced CIF, i.e. delivered to the main consuming centers - New York, Rotterdam and Singapore being the most important. They also trade a wider range of different products, from the heavy (residual fuel oil) to the light (gasoline), which sell into distinct markets. But their spot prices conform to the definition given above for crude, and they have the same importance in price formation more broadly.

The Meaning of the "Market Price"

Discussion about the market tends to be in terms of Brent and other marker grades, for one obvious reason: trade in markers in uniform and transparent, an epitome, whereas the trade in general is so heterogeneous as to be opaque. Brent is traded in standard-sized cargoes and the forward market uses, in addition, standardized contracts (Shell T&C); other crude markers, notably WTI and ANS in the U.S. and Dubai in the gulf, are similarly standardized into interchangeable units of trade. This in sharp contrast with the trade in other crudes (e.g. other North Sea crudes) in which everything except the quality of individual crudes is likely to vary. There are perhaps half-a-dozen crude markers in addition to the three mentioned, eighty or more crudes are widely-traded and another hundred are seen, but infrequently. In product markets the pattern is conceptually the same, but in practice it is far more complex: a uniform trade in marker grades and a heterogeneous trade in all other grades.

Spot Prices and Price Formation

If we go back to the way prices are determined, we can now make sense of the two sets of factors mentioned, which reflect two sorts of unity.

1. The marker and its market context:

   Whether explicitly or not, all prices are traded against a marker grade. Which is to say that participants have in mind, implicitly or explicitly, a price reference they are trading against. The determination of this reference price has a number of components:

   - The global context defines the extent to which all prices of crude and products move together. Thus, OPEC decisions, war and major supply crises will have an effect, usually operating over long cycles, on the world market.

- Regional supply/demand for crude (more local for products) will determine the price within a geographical area defined by supply. or tributary, possibilities and within a shorter time span. Chart 9 shows how independently prices for the three crude markers have moved during 1989/90. Product markets are more local still and the relationships between them are more attenuated (see chart 5,6 and 7). This does not mean that the markets have ceased to work; only that there is no supply connection that makes arbitrage possible within the relevant time span.

- The marker price is set by negotiation within this context. The price of Brent emerges from the trade in Brent *per se*. (The paper markets are important in determining these prices and, although the separation is artificial, discussion of them will be reserved for the following chapter.) It also emerges more subtly, or rather implicitly, from the trade in other North Sea crudes, since all crudes are traded against each other; in an efficient market, any crude price will imply another. Rather than see Brent in isolation, it is more realistic to see it as the *epitome of a trade of which it is an integral part*. The same is true of all marker prices, which both define and are defined by the trade in closely-related products.

  Product markers are different. Much more variable in quality, there may be a "most traded grade" (cf Platts definition of its prices), but the marker for a product is rarely traded as such. There is implicit in the trade in the market, e.g. North West European gasoil cargoes which is a Platonic ideal of a price which everybody knows and uses, but nobody encounters in real life except by accident.

2. Price-determining variables:

For reasons described in chapter 2, actual prices of individual transactions in the spot market are dispersed around the (implicit) marker. The prices are related to the marker and to each other by parity relationships that put a value on all of the price-determining variables. Some are simple relationships: for example, the specify gravity of a product bought by weight and sold by volume has a precisely-calculable effect on its price. Some are complex: the effect of sulphur content on the price of heavy fuel oil or home heating oil is almost never linear, although it ought to be. Some are incommensurable: the value of a cargo to a distress buyer, for example, can only be negotiated.

The resulting picture[3], if it could be plotted, would show a cloud of prices moving around the marker. The degree of dispersion depends on the nature of the trade. In the spot market for Brent, there is virtually no dispersion, since the material in uniform and traded in standard contracts. In the market for gasoil, there is considerable dispersion around the marker since there is wide variation between transactions.

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3 If the transaction data were available, it would be easy to illustrate graphically. The closet we are likely to get is the very detailed statistical analysis in the EC's "COMMA" study, which showed the distribution of prices for products in the spot trade.

To summarize, there are two outstanding features of the spot markets: their dynamism and efficiency. Depending on the product, they can be transparent and liquid ("good" markets), or the opposite. Because they are not determined by the planning (investment) priorities of the industry, they are sometimes characterized as a source of trouble, subject to manipulation and worse. They can also be seen as the truly economic, marginal markets and the source of free market prices. This issue will be discussed in Part V.

EMERGENCY ENERGY PROGRAM FOR EASTERN EUROPE
CRUDE OIL PURCHASING
APPENDIX C

Rapid Delivery Price and News Services

APPI Crude and Product Report
Weekly industry-concensus price report on Far East wet-barrel prices.
Vendor: APPI

ESAI Global Fundamentals
Weekly fax (hard copy follow-up detail) covering oil-market fundamentals: inventory levels, supply/demand trends, market analysis, etc.
Vendor: Energy Security Analysis, Inc./PEL

Oil Market Listener
Daily analysis of world petroleum markets and factors affecting market psychology; available via Telerate as well as fax and E-mail.
Vendor: Energy Information, Ltd. (EIL)

Opec Listener
Twice-weekly report, analyzing OPEC conferences and activities of major international oil-exporting countries; available via Telerate as well as fax and E-mail.
Vendor: Energy Information Ltd. (EIL)

Corporate Energy Listener
Weekly analysis of corporate planning and financial strategies of international oil companies; fax, Telerate, and other delivery options.
Vendor: Energy Information Ltd. (EIL)

Regional Energy Listener
Weekly (or more frequent) reports on structural changes in regional oil markets, plus country-by-country assessments.
Vendor: Energy Information Ltd. (EIL)

Energy Environment Listener
Bimonthly reports on immediate and long-term impact on oil industry of environmental issues; fax and other options.
Vendor: Energy Information Limited (EIL)

Petrochemical Listener
Bimonthly report assessing interaction of petrochemical and petroleum-refining industries; fax and other options.
Vendor: Energy Information Limited (EIL)

Oil Price Information Service (OPIS) Telex
Daily price report (delivered via telex and other rapid-delivery means) covering primarily U.S. products' prices; specializing in motor-fuel rack pricing.
Vendor: United Communications

Oil Afloat
Unique, weekly fax report on international oil shipments, volumes "in-transit," and floating stockpiles.
Vendor: Joe Roeber Associates (JRA)

Opec Compass
New service from the *Oil Daily*.
Vendor: *The Oil Daily*

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Petroleum Argus Price Report
Highly respected daily fax/telex price assessments, specializing in European and North Sea pricing.
Vendor: Petroleum Argus

Platt's U.S. Marketscan
Daily summary of U.S. market activity and price assessments for major markets; fax, telex or other delivery means.
Vendor: McGraw-Hill/Platt's

Platt's European Marketscan
Daily summary of market activity and price assessments for major European markets; fax telex or other delivery means.
Vendor: McGraw-Hill/Platt's

Platt's Asia-Pacific/Arab Gulf Marketscan
Daily summary of market activity and price assessments for major Far East and Arab Gulf markets; fax, telex or other.
Vendor: McGraw-Hill/Platt's

Platt's Oilgram Newswire
Daily report on economic, commercial, and political events affecting oil markets worldwide; fax, telex or other.
Vendor: McGraw-Hill/Platt's

Platt's Crude Oil Marketwire
Daily report of spot-price assessments and netbacks/yields in principle refining centers for major international crudes; fax, telex or other delivery means.
Vendor: McGraw-Hill/Platt's

Platt's Rack Fax
Daily report of rack mogas and diesel prices in the U.S. Three separate editions (West Coast, Mid-Continent and East Coast); fax, telex or other means.
Vendor: McGraw-Hill/Platt's

Platt's Bunkerwire
Widely read weekly report on marine fuel prices and supply availabilities in ports worldwide; fax, telex and other.
Vendor: McGraw-Hill/Platt's

Platt's Crude Tankerwire
Daily report on fuel-oil and crude-oil shipments worldwide; dirty charter fixtures; fax, telex and other.
Vendor: McGraw-Hill/Platt's

Platt's Product Tankerwire
Daily report on clean-product tanker market; clean-tanker fixtures; fax, telex and other.
Vendor: McGraw-Hill/Platt's

Platt's Chemical Tankerwire
Weekly report on liquid chemical, clean products, chemical, gas, and LPG shipping markets; fax, telex and other.
Vendor: McGraw-Hill/Platt's

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Platt's U.S. Petrochemicalscan
Weekly report on current petrochemical spot prices in major U.S. markets; fax, telex and other.
Vendor: McGraw-Hill/Platt's

Platt's European Petrochemicalscan
Weekly report on current petrochemical spot prices in major European markets; fax, telex and other.
Vendor: McGraw-Hill/Platt's

Platt's LPGaswire
Weekly report on LPG-market news, spot prices and supply/demand data; fax, telex and other.
Vendor: McGraw-Hill/Platt's

Hardcopy News and Price Reports Daily Services

Energy Daily
Newsletter on industry news and regulatory issues affecting energy markets.
Vendor: King Publishing Group

The Oil Daily
Newspaper-style daily with industry news, some pricing and supply/demand coverage.
Vendor: *The Oil Daily*

Platt's Oilgram Price Report
Newsletter providing worldwide pricing for crude oil and products in all major markets; electronic access possible.
Vendor: McGraw-Hill/Platt's

Platt's Oilgram News Report
Newsletter covering industry news worldwide; electronic access possible.
Vendor: McGraw-Hill/Platt's

Weekly Services

London Oil Reports/The Barrel
Weekly report and analysis of global-oil and petrochemical markets; some pricing and supply/demand data.
Vendor: *London Oil Reports* (LOR/ICIS)

Middle East Economic Survey (MEES)
Middle East political and economic events; OPEC policy.
Vendor: *Middle East Economic Survey* (MEES)

Octane Week
Analysis of oxygenated fuels markets; regulatory climate, pricing and supply/demand outlook for MTBE, ethanol, etc.
Vendor: Information Resources, Inc.

Oil and Gas Journal (O&GJ)
Oil-market news, technical issues, E&P, and refining, etc.
Vendor: PennWell Publishing Company

Oil Buyer's Guide (OBG)
Oil-market trade news; pricing; mainly U.S. focus.
Vendor: *Oil Buyer's Guide*

Oil Buyer's Guide International (OBGI)
International oil-market news; pricing; etc.
Vendor: *Oil Buyer's Guide*

Oil Price Information Service (OPIS)
U.S. rack pricing for gasoline and diesel; some pipeline prices; detailed by cities and individual rack wholesalers.
Vendor: United Communications Group

Petroconsultants' International Oil Letter
Weekly update on international oil exploration activities and other oil-market news.
Vendor: Petroconsultants, Inc.

Petroleum Intelligence Weekly (PIW)
Authorative international oil-market analysis; some pricing series; OPEC production; much more.
Vendor: *Petroleum Intelligence Weekly*

Platt's Week
International oil-market news and analysis.
Vendor: McGraw-Hill/Platt's

Weekly Energy Listener
International oil-market news and analysis.
Vendor: Energy Information, Ltd. (EIL)

Weekly Petroleum Argus
International oil-market news and analysis; excellent coverage of Northern European markets and Brent trade.
Vendor: Petroleum Argus

Monthly Services

IEA (International Energy Agency) Monthly Oil Market Report
Monthly OECD and OPEC oil market supply/demand figures; plus additional oil market analysis.
Vendor: OECD Publications

Platt's Oil Export/Import Report
U.S. oil import/export data by port of entry/export and type; customs data; excellent and unique.
Vendor: McGraw-Hill/Platt's

Stockwatch
Global inventory levels by region; commercial vs. government stocks; products vs. crude; oil in-transit.
Vendor: Energy Security Analysis

Petroleum Economist
In-depth treatment of various issues affecting international oil markets; country studies; sometimes unique coverage.
Vendor: *Petroleum Economist*

Petroleum Market Intelligence (PMI)
Newsletter format with regional oil-market summaries and detailed price series; OPEC oil production summaries; more.
Vendor: *Petroleum Intelligence Weekly*

World Oil
Industry news and analysis; primarily E&P focus.
Vendor: Gulf Publishing Co.

Annual and Periodic Publications

BP Annual Statistical Review
Annual oil supply/demand statistics; oil trade patterns; much more; available on tape as well as hard copy.
Vendor: British Petroleum

International Petroleum Encyclopedia
Massive quantities of detailed data covering units in individual refineries worldwide; oil and gas production and reserves field-by-field; much more. Most detailed statistics available; hard copy or via *OGJ* dial-up service.
Vendor: PennWell Publishing Company

Various publications by the International Energy Agency (IEA), including *World Energy Statistics*
Vendor: IEA Energy Publications

Various publications by the U.S. Department of Energy/Energy Information Administration
Vendor: DOE/EIA

Statistical Data Bases Via Floppy-disk, Mangetic Tape, Etc.

Newport Associates Energy Data Base
Energy and natural gas data base, including financial operating and stock performance and other company data; hardcopy, disk or on-line options.
Vendor: Newport Associates, Inc.

EIL Energy Economics Database
Data on oil, gas, coal, and macroeconomic indicators, assembled on comparable basis; diskette.
Vendor: Energy Information, Ltd. (EIL)

EIL Company Performance Database
Operating and financial indicators of leading international and national oil companies; diskette.

PIW's Key Crude Prices
Data going back to 1860, in both current and inflation-adjusted terms; hard copy or disk; spreadsheet format.
Vendor: *Petroleum Intelligence Weekly*

PIW's Top 100 World Oil and Gas Companies
Companies ranked by six operating variables; unique information about national oil company performance; hard copy or disk; spreadsheet format.
Vendor: *Petroleum Intelligence Weekly*

PIW's World Trade Patterns
Official U.S. and Japanese import/export data; hard copy or disk; spreadsheet format.
Vendor: *Petroleum Intelligence Weekly*

PIW's Tanker Spot Rates
International tanker rates; hard copy or disk; spreadsheet.
Vendor: *Petroleum Intelligence Weekly*

Telerate Data Base Service
Access via diskette or modem to massive *Telerate* historical data-base covering worldwide crude and products pricing; supply/demand; tanker movements; much more.
Vendor: Telerate Systems, Inc.

The Energy Futures Group
Oil futures, options, spot-price, and select other oil-market information; hard-copy, disk, or on-line access.
Vendor: Energy Futures Group

GLOBAL PRICE INFORMATION SERVICES

Detailed Oil and Gas Information Sources

On-line Price, News, and Data Services

Platt's EMIS
Live futures and daily updates to Platt's spot prices; access to massive, historical Platt's data series; industry statistics, including API's; ability to add analytical software; petrochemical and oil news, much more.
Vendor: McGraw-Hill/Platt's

Platt's Global Alert
Miniversion of *EMIS*, without full, historical data-retrieval option; simpler and less costly.
Vendor: McGraw-Hill/Platt's

Platt's Petrochemical Alert
Daily reports on worldwide naphtha and U.S. gas-liquids markets; weekly chemical price assessments; market news; shipping data; financial market information; much more.
Vendor: McGraw-Hill/Platt's

PetroFlash
Specialized spot-oil price reports, available through dial-up and electronic services.
Vendor: *Oil Buyer's Guide*

PetroScan
Specialized spot-oil price reporting service, market news, and access to various statistics; dial-up access.
Vendor: United Communications Group

Telerate Energy Service
Live futures; spot-price assessments; access to broad range of industry statistics and auxiliary services; ability to utilize many analytical packages. Extremely comprehensive.
Vendor: Telerate Systems, Inc.

Reuters Monitor/Pipeline
Live futures; spot-price assessments; oil industry, financial market, and general news; access to industry statistics, auxiliary services from third-party information suppliers, and ability to incorporate analytical packages. Extremely comprehensive.
Vendor: Reuters, Ltd.

Bridge Information System World Service
Financial as well as energy data, including live futures feed, data on stock futures, options and bond instruments; economic and financial news.
Vendor: Bridge Information Systems, Inc.

Computer Petroleum Corporation
U.S. rack products quotations as well as futures and historical data bases. Company customizes information packages for customers.
Vendor: Computer Petroleum Corporation

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On-line Statistics, Data-Base and Abstracting Services

API Abstracting and Energy Service
Closely watched weekly U.S. statistics on oil imports, exports, production, consumption, inventory levels, etc. Available via dial-up service or other electronic services.
Vendor: American Petroleum Institute (API)

DOE/EIA Energy Statistics
Basis for most API statistics, but released later than API and less closely watched. Wide variety of U.S. and international oil and gas statistics. Available via dial-up service, via electronic screen services, and in hard copy or magnetic tape.
Vendor: DOE/EIA

DRI/Platt's Oil-Price Database
Access to Platt's massive, historical oil-price data-base series; via dial-up and other delivery options.
Vendor: McGraw-Hill/DRI

DRI/Platt's Energy Database
U.S. energy (coal, gas, nuclear, etc.) data; available via dial-up and other delivery options.
Vendor: McGraw-Hill/DRI

DRI/Platt's International Oil Database
OECD oil price, consumption and supply data; available via dial-up and other delivery options.
Vendor: McGraw-Hill/DRI

Newsnet
Full-text news retrieval service accessing a vast number of newsletter and new reporting services; on-line.
Vendor: *Newsnet*

Mead Data/Nexis
General business news and data retrieval; offers access to massive library; on-line.
Vendor: Mead Data Central

Mead Data/Lexis
Financial information, news, and data retrieval; access to brokerage and annual report data; on-line.
Vendor: Mead Data Central

Mead Data/Eclipse
Electronic clipping service that automatically identifies articles per user's predetermined search request; on-line.
Vendor: Mead Data Central

Oil & Gas Journal Data Base/PennWell
Massive database offering access to comprehensive data on E&P, refining, supply/demand, pipelines, petroleum prices; over 50,000 time series available; on-line or diskette.
Vendor: PennWell Publishing Company

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Technical and Fundamental Analysis Services Comprehensive Analysis Systems

Marketview
Powerful and widely used graphics and analysis package teamed with real-time futures and wet-barrel price vendors. System provides both technical and fundamental analytical capabilities. Available through real-time data providers as well as vendor.
Vendor: Marketview Software

Saladin/PAWS
Sophisticated decision support system, highlighted by the PAWS (Petroleum Analysis Work Station) system, which provides database, data acquisition, netback analysis, analysis and formulas, graphing and reporting functions. The system is newer than *Marketview*.
Vendor: Saladin Computer Systems

Technical Analysis Systems

ADP
High-tech technical analysis software; real-time price feed.
Vendor: ADP Comtrend

Commodity Quote Graphics
High-tech technical analysis software.
Vendor: Commodity Quote Graphics

Com-Tech Software
Options software to calculate volatility, fair-market value and spreads; graphics and position analysis.
Vendor: Com-Tech Software

Backtrack
Historical futures data analysis system with real-time feed purchased separately.
Vendor: MicroVests

SystemWriter
Highly regarded historical futures analysis system with real-time feed purchased separately. Unique in ability to create custom trading packages for each user.
Vendor: Omega Research

Teletrac
Real-time technical analysis software.
Vendor: Telerate Systems, Inc.

Market Vision
Real-time charting and technical analysis applications for energy prices from Platt's Global Alert live futures feed.
Vendor: Market Vision Corp.

For a master-listing, see *Futures* magazine, "Reference Guide to Futures/Options Markets"; published annually.
Vendor: *Futures*

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Technical Analysis Advisory Services

Commodex
Futures market analysis and advisory service.
Vendor: Equidex

Boslego
Futures market analysis and advisory service.
Vendor: Boslego Corp.

For a master-listing, see *Futures* magazine, "Reference Guide to Futures/Options Markets"; published annually.
Vendor: *Futures*

Trading, Position Monitoring and Accounting Systems

FutureTrader
Physical and futures position-monitoring system software; matches trades, calculates margin requirements, etc.
Vendor: Collins Systems

OMR
Position-monitoring system software; similar to *FutureTrader*.
Vendor: Opti-Management Resources

TradeNet
Decision-support software; tracks deals and allows other traders in system to know trades made and remaining opportunities. On-line to mainframe or download to PC.
Vendor: TradeNet

For a master-listing, see *Futures* magazine, "Reference Guide to Futures/Options Markets"; published annually.
Vendor: *Futures*

Hard-Copy Charting Services

Commodity Price Charts
Technical analysis charts: hard copy.
Vendor: Commodity Price Charts

Commodity Chart Service
Technical analysis charts; multiple options; hard copy.
Vendor: Commodity Research Bureau

Spread Scope
Technical analysis charts; multiple options; hard copy.
Vendor: Spread Scope, Inc.

For a master-listing, see *Futures* magazine, "Reference Guide to Futures/Options Markets"; published annually.
Vendor: *Futures*

Section 11

Pricing Alternatives

Advanced Pricing Techniques

Including

Exchange - Traded Options

Swaps and Derivatives

MARKET MAKING

- A TWO WAY PRICE
- A "MARKET" SPREAD
- A FIRM DEALING PRICE
- CHOICE OF VOLUME
- FALLBACK TO A PUBLISHED PRICE
- AVOIDANCE OF OPERATIONAL COMPLICATIONS
- A "PHYSICAL" CARGO
- BRENT, CASH WTI, DUBAI, UNLEADED, NO.2 HEATING OIL, GAS OIL, NAPHTHA, SELECTED SPREADS (E.G. BRENT/WTI, BRENT INTERMONTH ETC)

PRICE FIXATION DEAL

OR TRIGGER PRICING

BUYING OR SELLING PHYSICAL CARGOES ON A DIFFERENTIAL TO AN ACTIVELY TRADED CRUDE OIL OR PRODUCT.

FIXING THE PRICE OF PHYSICAL CARGOES BY INCREMENTS AT YOUR DISCRETION WITHIN AN AGREED FRAMEWORK.

ARE OFFER TO BUYERS AND SELLERS.

PRICE FIXATION DEALS

JYING OR SELLING PHYSICAL CARGOES ON A DIFFERENTIAL TO AN :TIVELY TRADED CRUDE OIL [OR OIL PRODUCT]

:AMPLES

MAY 10 - 20 FORTIES AT JUNE BRENT PLUS 30¢

JUNE 10 - 15 OMAN AT JULY DUBAI PLUS $1.50

:ED TO AGREE

1.REFERENCE CRUDE OIL (MARKER) - GRADE/MONTH

2. DIFFERENTIAL OF ACTUAL CRUDE OIL TO MARKER CRUDE

3. TIME ALLOWED FOR PRICE TO BE CALLED

4. NUMBER OF OPPORTUNITIES TO CALL THE PRICE

)TE

THIS IS NOT A DEAL WHERE PRE-ARRANGED PUBLISHED PRICES ON A SERIES OF PRE-ARRANGED DAYS ARE UTILIZED TO FIND PRICE.

AT OUTSET AGREE DIFFERENTIAL TO BRENT (OR OTHER MARKER) ONLY

	MARKET PRICE	000'S BARRELS PRICED
DECEMBER 1	18.20	
DECEMBER 2	18.35	100
DECEMBER 3	18.15	
DECEMBER 4	18.18	
DECEMBER 5	18.20	
DECEMBER 8	18.45	50
DECEMBER 9	18.55	50
DECEMBER 10	18.20	
DECEMBER 11	18.20	
DECEMBER 12	18.21	
DECEMBER 15	18.40	100
DECEMBER 16	18.35	
DECEMBER 17	18.32	100
AVERAGE	18.29	400

SALE PRICE: 18.39 FOR 400,000 BBLS

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ADVANTAGES OF PRICE FIXATION DEALS

ALLOW USERS TO HAVE AN ACTIVE ROLE IN PRICING PROCESS

ALLOWS HEDGING WITHOUT DIRECT USE OF FORWARD OR FUTURES MARKETS

ELIMINATES OPERATIONAL RISKS OF USING FORWARD MARKETS (DAISY CHAINS ETC)

PRICING CAN CONTINUE WELL AFTER CARGO HAS LIFTED (BY ROLLING MARKER)

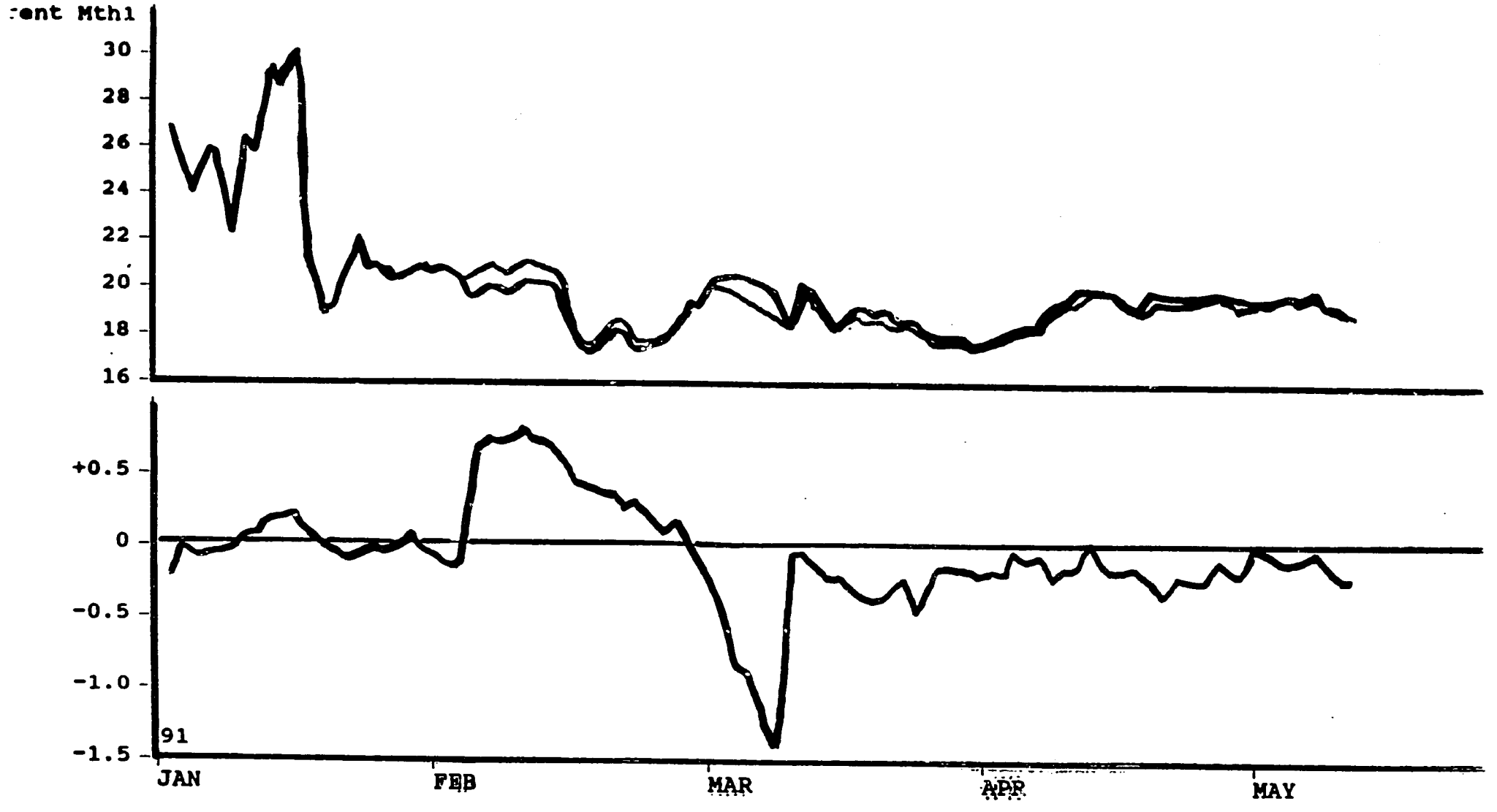
FLEXIBILITY IN ESTABLISHING THE PRICE MARKER

CAN BE CUSTOMISED TO INCLUDE PRICE FLOORS OR CEILINGS

VIA THE USE OF A MARKET MAKER CAN ALLOW A BUYER AND A SELLER TO TRADE AT A TIME THEY MAY NOT OTHERWISE CHOOSE TO DO SO

Brent Dated / Brent Month 1 - Spot Prices

2/01/91 - 17/05/91



Brent Dated Mid ($/BBL)
Brent Month 1 Mid ($/BBL)

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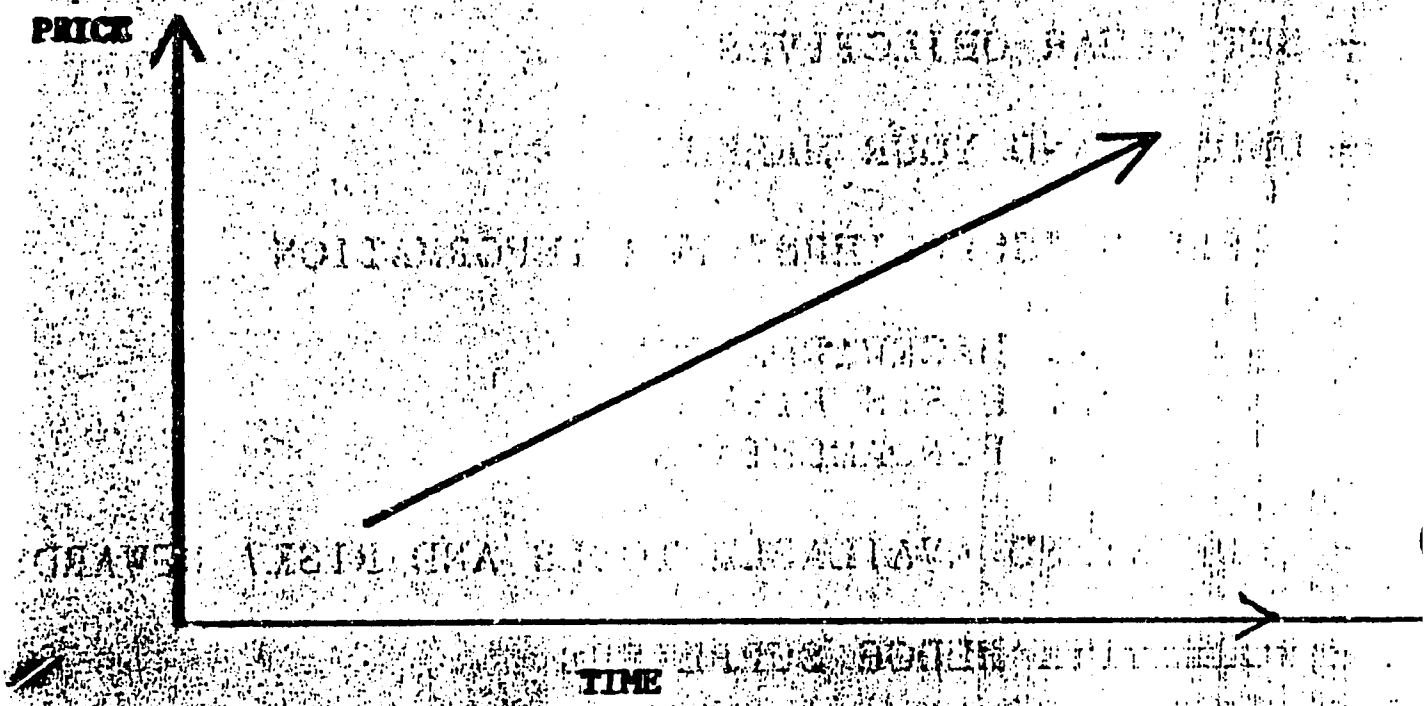
BACKWARDATION



TODAY'S PRICE RELATIONSHIP :

	$/BBL
[illegible] MONTH 1	20.00
[illegible] MONTH 2	19.50
[illegible] MONTH 3	19.00
[illegible] MONTH 4	18.50

15th APRIL:

DELIVERY MONTH	PRICE $/BBL
DATED	20 (APRIL AND EARLY MAY)
MAY	19
JUNE	18
JULY	17

EXAMPLE: PRODUCER SELLING FORTIES 3-5 MAY

N.B. FORTIES IS WORTH 10 CENTS PER BARREL MORE THAN BRENT

1. FIXED PRICE: $20.10 (DATED BRENT PLUS 10 CENTS PER BARREL)

2. ON B/L DATE: MAY BRENT PLUS $1.00, PLUS 10 CENTS PER BARREL ASSUME B/L DATE IS 4TH MAY

4th MAY:

DELIVERY MONTH	PRICE $/BBL
DATED	20 (MAY)
MAY	20
JUNE	19
JULY	18

PRICE WILL BE: 20.00 + 1.10 = 21.10, I.E. $1.00 HIGHER THAN IN 1.

N.B. THIS ASSUMES BACKWARDATION STAYS CONSTANT AND PRICES ARE CONSTANT. THIS EXAMPLE JUST TAKES ACCOUNT OF BACKWARDATION EFFECT OVER TIME.

3. IN THE SAME EXAMPLE ASSUME PRICES ON 4th MAY:

DELIVERY MONTH	PRICE $/BBL
DATED	20.50 (MAY)
MAY	20.50
JUNE	19.50
JULY	18.50

PRICE WILL BE: 20.50 + 1.10 = 21.60, I.E. $0.50 HIGHER THAN IN 2.

N.B. THE BACKWARDATION STAYED THE SAME BUT PRICE LEVELS CHANGED

10th JUNE AND
12th JULY

4th MAY PRICES:

DELIVERY MONTH	PRICE $/BBL
DATED	20.50 (MAY)
MAY	20.50
JUNE	19.50
JULY	18.50

ONE THIRD OF PRICE: 21.60 (AS IN 3)

NEXT STAGE: ROLLING OF MARKER (SAY 4th MAY)

NEW PREMIUM TO JUNE BRENT: 2.10 (1.10 + 1.00)

10th JUNE PRICES:

DELIVERY MONTH	PRICE $/BBL
DATED	20.75 (JUNE)
JUNE	20.75
JULY	19.75
AUGUST	18.75

SECOND THIRD OF PRICE: 22.85 (20.75 + 2.10)

NEXT STAGE: ROLLING OF MARKER (SAY ON 10th JUNE)

NEW PREMIUM TO JUNE BRENT: 3.10 (2.10 + 1.00)

DELIVERY MONTH	PRICE $/BBL
DATED	20.00 (JULY)
JULY	20.00
AUGUST	19.00
SEPTEMBER	18.00

LAST THIRD OF PRICE: 23.10 ($20.00 + 3.10)

FINAL PRICE = (21.60 + 22.85 + 23.10) /3 = 22.52

Exchange-Traded Oil Options Contracts

Exchange	Contract	Status	Activity
I) NYMEX	• WTI Crude	Active	OI=200,000(Puts&Calls) Vol.=20,000/Day 18 months forward
	• No 2 Heating Oil	Active	OI=25,000 Vol.=3,000/Day
	• Unleaded Regular Gasoline	Active	OI=35,000 Vol.=5,000/Day
II) IPE	• Brent Crude Oil Options	Active	OI=20,000 Vol.=4,000/Day
	• Gasoil Options	Active	OI=15,000 Vol.=3,000/Day

"Over-the Counter" Options and "Swap" Markets

- Un-regulated, commercial price hedging arrangements entered directly into by banks, trading companies, oil producing refining and consuming companies, usually out of major financial centers (N.Y., London, etc.).
- Normally long-term arrangements (i.e., 6 months to 10 years +), with payments flowing monthly or quarterly.
- Individually negotiated pricing and payment terms, but source standardization of contracts is developing as markets grow.
- Major uncertainty concerns the credit risk of the counter-parties, making good on their payment over the long term.

USE OF CRUDE OIL OPTIONS

- **OPTION DEFINITION**

CONTRACT WHICH GIVES BUYER THE OPTION TO BUY OR SELL A CRUDE OIL FUTURES CONTRACT AT A FIXED PRICE - THE STRIKE PRICE - WITHIN A SPECIFIED TIME PERIOD.

- **OPTION CONTRACTS** - TWO TYPES

	CALL		PUT
AT OUTSET FOR WITH EXERCISE	PAYS PREMIUM UPSIDE PRICE PROTECTION RECEIVES LONG FUTURES	BUYER	PAYS PREMIUM DOWNSIDE PRICE PROTECTION RECEIVES SHORT FUTURES
AT OUTSET FOR WITH EXERCISE	RECEIVES PREMIUM UPSIDE PRICE EXPOSURE DELIVERS LONG FUTURES	SELLER	RECEIVES PREMIUM DOWNSIDE PRICE EXPOSURE DELIVERS SHORT FUTURES

- **DISPOSITION OF OPTIONS CONTRACT**

RESELL (CLOSE OUT)

EXERCISE

LAPSE (EXPIRES UNEXERCISED)

DEFINITIONS

- Option - a contractual agreement to purchase or sell a crude oil futures contract for a specific price within a specific time period, contingent on the option holder's decision to exercise.

- Exercise - option holder (buyer) has the right, but not the obligation, to exercise the option contract at the specified (strike) price, and within the specified time period (term to expiration).

- Seller's/Writer's Obligation to Deliver - in the event of buyer's exercise, seller has the obligation to deliver the crude oil futures contract at the specified strike price.

- Put Option - buyer has the right, but not the obligation, to sell crude oil futures at the strike price.

- Call Option - buyer has the right, but not the obligation, to buy crude oil futures at the strike price.

- Premium - the price paid by the buyer to the seller for the option.

- Option Identification: Type = Put or Call
  Class = Expiration Date
  Series = Strike Price

INTRINSIC VALUE - AMOUNT BY WHICH STRIKE PRICE IS "IN THE MONEY".

	CALL	PUT
IN THE MONEY	MARKET > STRIKE	MARKET < STRIKE
AT THE MONEY	MARKET = STRIKE	MARKET = STRIKE
OUT OF THE MONEY	MARKET < STRIKE	MARKET > STRIKE

2B

USE OF CRUDE OIL OPTIONS

- **OPTION DEFINITION**

CONTRACT WHICH GIVES BUYER THE OPTION TO BUY OR SELL A CRUDE OIL FUTURES CONTRACT AT A FIXED PRICE - THE STRIKE PRICE - WITHIN A SPECIFIED TIME PERIOD.

- **OPTION CONTRACTS** - TWO TYPES

	CALL		PUT
AT OUTSET FOR WITH EXERCISE	PAYS PREMIUM UPSIDE PRICE PROTECTION RECEIVES LONG FUTURES	BUYER	PAYS PREMIUM DOWNSIDE PRICE PROTECTION RECEIVES SHORT FUTURES
AT OUTSET FOR WITH EXERCISE	RECEIVES PREMIUM UPSIDE PRICE EXPOSURE DELIVERS LONG FUTURES	SELLER	RECEIVES PREMIUM DOWNSIDE PRICE EXPOSURE DELIVERS SHORT FUTURES

- **DISPOSITION OF OPTIONS CONTRACT**

RESELL (CLOSE OUT)

EXERCISE

LAPSE (EXPIRES UNEXERCISED)

♦ **Elements of Option Value: Known Factors - Easily Quantifiable**

◊ **Intrinsic Value**, or amount by which underlying market (futures or cash) price exceeds the strike price

vs.

◊ **Extrinsic Value**, or the amount by which the option premium exceeds its intrinsic value, as determined by the following:

- o Term to expiration... the longer the term the higher the premium,
- o Short-term interest rates... the higher the rate, the lower the premium, and
- ● **Unknown Factor - Most Important**
- o **Underlying Price Volatility**, or the expected variation in underlying market prices, as indicated by the implied volatility values generated by options pricing models, after accounting for the above (known) factors.

♦ **Basic Commodity Option Pricing Model:** Modified Black/Scholes Model, utilizing the following formulas for

calls: $C=e^{-rt}\,[UN(d_1) - EN(d_2)]$, where $d_1 = \dfrac{\ln(U/E) + s^2\,t/2}{s\sqrt{t}}$

and $d_2 = d_1 - s\sqrt{t}$

puts: $p = e^{-rt}\,[UN(d_1) - EN(d_2)]$

with C = Call option premium

P = Put option premium

e^{-rt} = natural log base value = 2.72, raised to the negative power of (r) x (t), where r= short-term interest rates and t = time till expiration, expressed as a percentage of one year (e.g., 90/365 = 0.247)

U = underlying price of the associated futures contract

E = strike or exercise price of the option contract

N = Normal probability distribution of

ln = natural log

s = standard deviation of price movement, or volatility

COMBINATIONS:

Vertical	-	same type, same expiration, different strikes
Horizontal	-	same type, same strike, different expiration
Diagonal	-	same type, different strike, different expiration
Straddle	-	different type, same strike, same expiration
Strangle	-	different type, different strike, same expiration
Fence	-	different type, opposite positions, (i.e., synthetic long or short futures)
Bull or Bear Spreads		refer to combinations based on expected price an volatility.

PRICING TERMS:

Delta	-	percent change in the option premium relative to the underlying futures price
Gamma	-	the rate of change of the delta
Theta	-	change in the option premium due to the passage of time
Vega	-	change in the option premium due to a change in implied volatility

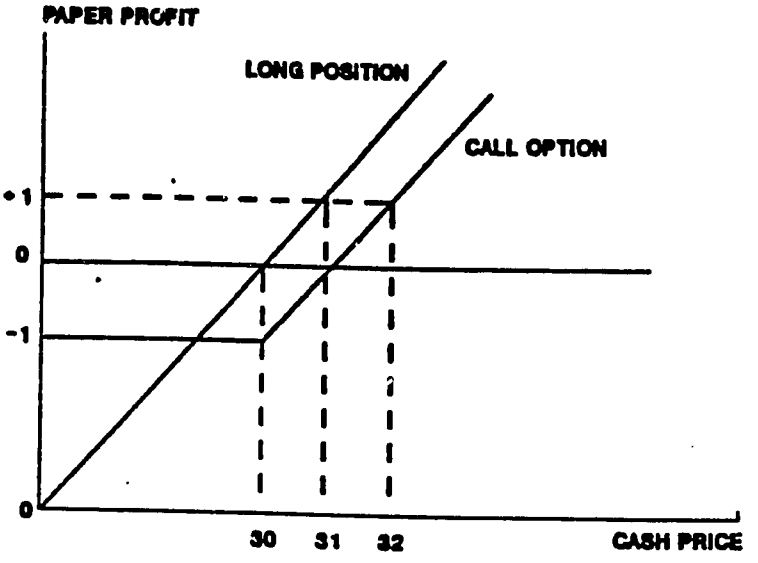
Options vs. Futures: Basic Trading Strategies

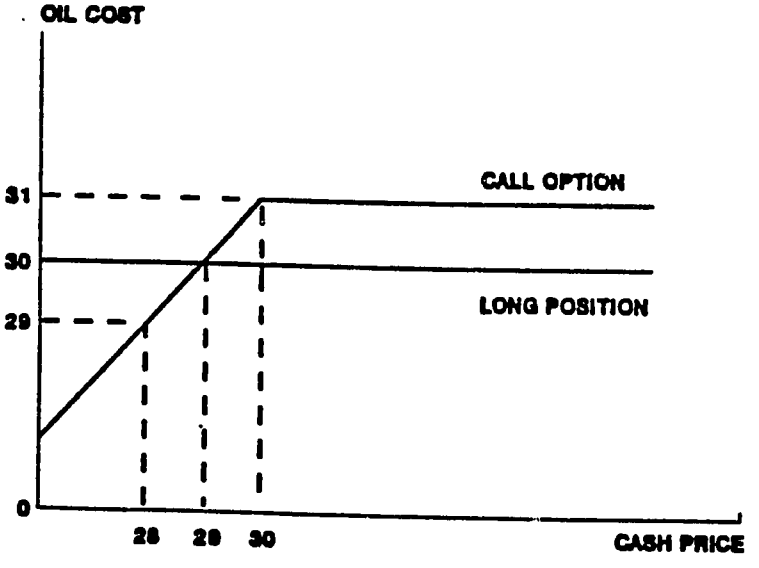
When Bullish or Exposed to Rising Prices	When Bearish or Exposed to Falling Prices
Long Futures	Short Futures
Sell Puts	Buy Puts
Buy Calls	Sell Calls

Difference in Strategies

	FUTURES		OPTIONS
Risk	Full Exposure to Adverse Price Movement	**Buyer**:	Exposure to Adverse Price Movement Limited to Premium Expense
vs.		**Seller**:	Exposure to Adverse Price Movement off-set only by Premium Received
Reward	Full Benefit of Favorable Price Movement	**Buyer**:	Full Benefit of Favorable Price Move (Less Premium Paid
		Seller:	Limited to Premium Received

FUTURES VS. OPTIONS





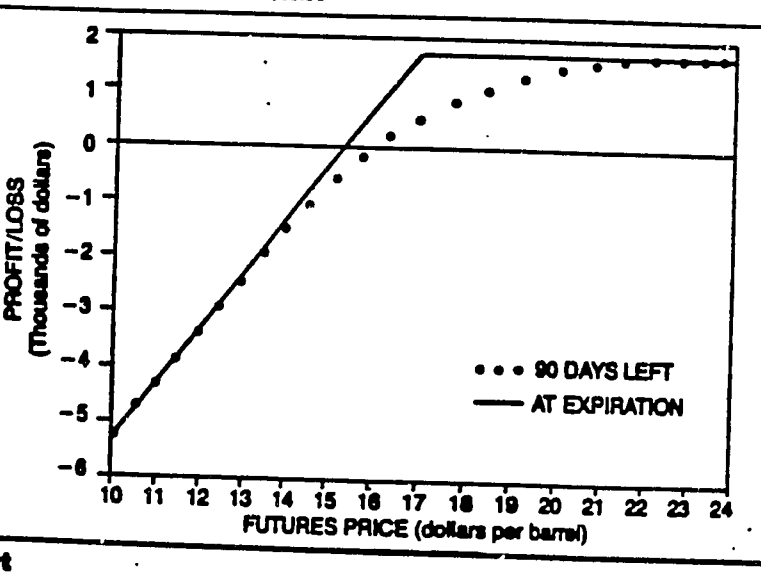
Covered Call:
A covered call includes the sale of a call against a long futures position. Premium income is earned if futures move sideways to slightly higher or lower. This position is bullish (note the +.60 delta) and is helped by lower volatility and the passage of time. Profits are limited on the upside; losses are unlimited as prices decline. The premium received from the sale of the call, however, acts as a partial hedge against the futures position as prices decline.

Long Put:
This position gives the holder the right but not the obligation to sell futures at $16 per barrel for a specific period of time. This position profits if prices decline, while total risk is limited to the premium paid. Increasing volatility favors this position while the passage of time works against this trade. Hedgers can use buy-put strategies for unlimited downside protection yet still participate in market rallies, should they occur.

Covered Call

Position	*Premium*	*Dollar Premium*	*Delta*
Buy 1 $16 Futures			+1.00
Sell 1 $17 Call	$0.70	$700	− .40
Net Credit	$0.70	$700	
Net Delta			+ .60

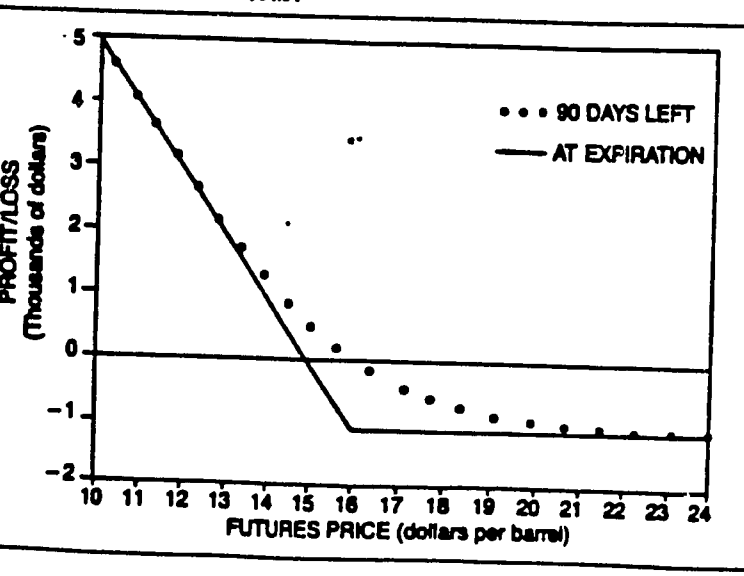
Maximum Risk:	Unlimited on downside
Maximum Profit:	$1.70 per barrel or $1700 per covered call
Breakeven Futures Price:	$15.30



Long Put

Position	*Premium*	*Dollar Premium*	*Delta*
Buy 1 $16 Put	$1.09	$1,090	−.47

Maximum Risk:	$1.09 per barrel or $1,090 per contract
Maximum Profit:	Unlimited on the downside
Breakeven Futures Price:	$14.91



Six Basic Options Strategies

Options on crude oil futures have experienced rapid growth in terms of volume and open interest since their introduction on the NYMEX trading floor on November 14. This popularity reflects the great versatility of these instruments. Options permit traders to construct positions to suit virtually any view about market direction, timing and volatility, while tailoring the level of risk.

Presented here are six basic strategies along with their profit and loss profiles. Time is a critical factor in option valuation. This is illustrated in the accompanying charts which show the profit/loss profiles both at expiration and with 90 days remaining to expiration. The following assumptions were entered into the "Black" model to calculate theoretical option premiums:

- Futures price of $16 per barrel (when position established)
- Volatility of 35 percent
- Interest rate of 6 percent

In each example, *debits* are monies paid out by the buyer of the position and *credits* are cash funds received by the seller (or writer) of the option position. The *delta* is the amount by which an option premium will change relative to a change in the underlying futures price.

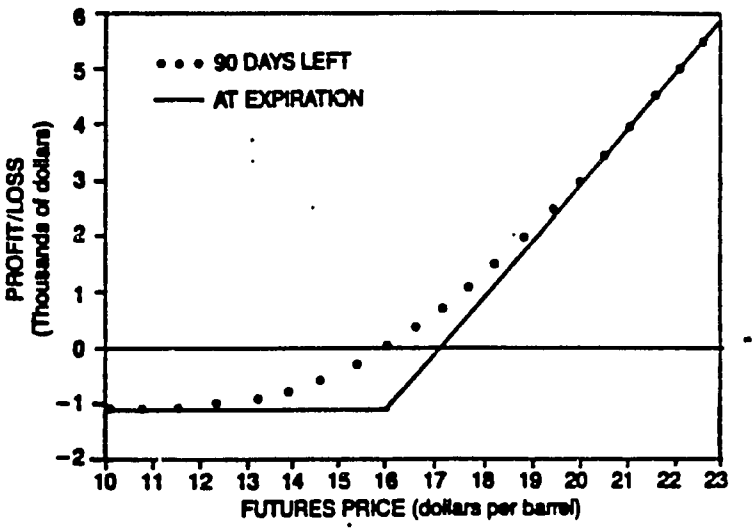
Long Call:
A long call strategy gives the holder the right, but not the obligation, to buy futures at $16 per barrel for a specific period of time. This position profits if prices rally. Profits are unlimited on the upside; total risk is limited to the premium paid regardless of where futures trade. This trade is helped by increasing volatility, while the passage of time works against it. Hedgers can use buy call strategies to lock in purchase prices and still benefit from market declines.

Short Call:
In exchange for the premium received, the writer of a call option is obligated to sell the underlying futures at $17 per barrel, any time prior to expiration, if assigned. This position maximizes profits if prices are at $17 or lower at expiration. Profits are limited to the premium received, while risk is unlimited as prices climb above the value of the strike price plus the premium. Declining volatility is favorable to the trade, as is the passage of time.

Long Call

Position	*Premium*	*Dollar Premium*	*Delta*
Buy 1 $16 Call	$1.09	$1,090	+.53

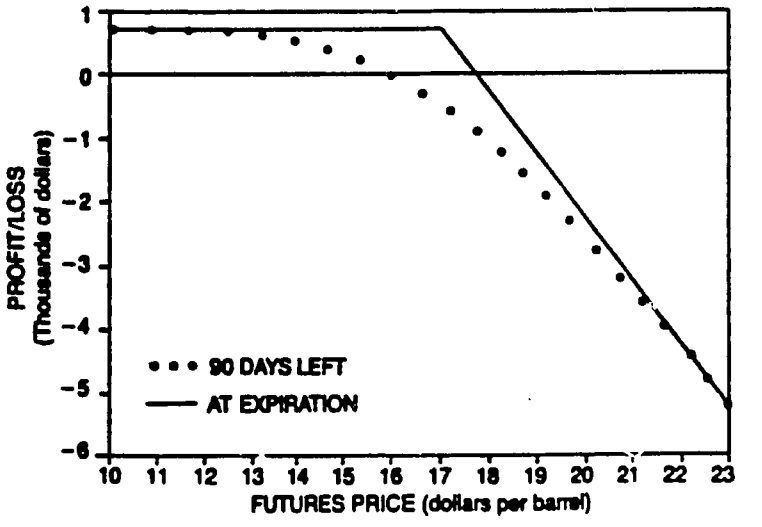
Maximum Risk:	$1.09 per barrel or $1,090 per contract
Maximum Profit:	Unlimited on the upside
Breakeven Futures Price:	$17.09



Short Call

Position	*Premium*	*Dollar Premium*	*Delta*
Sell 1 $17 Call	$0.70	$700	−.53

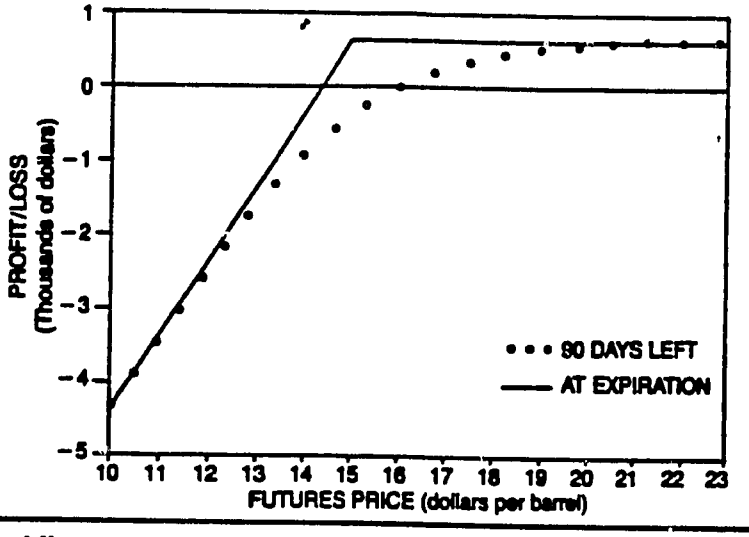
Maximum Risk:	Unlimited on the upside
Maximum Profit:	$0.70 per barrel or $700 per contract
Breakeven Futures Price:	$17.70



Short Put

Position	Premium	Dollar Premium	Delta
Sell 1 $15 Put	$0.64	$640	+.32

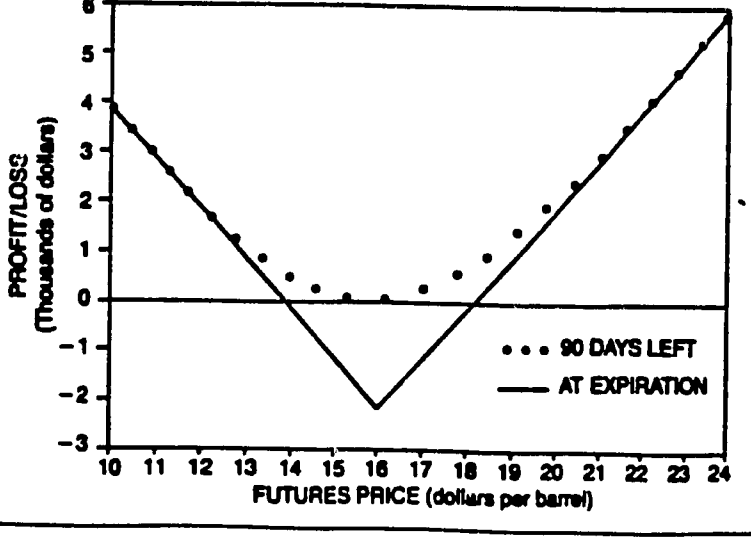
Maximum Risk:	Unlimited on the downside
Maximum Profit:	0.64 per barrel or $640 per contract
Breakeven Futures Price:	$14.36



Long Straddle

Position	Premium	Dollar Premium	Delta
Buy 1 $16 Call	$1.09	$1,090	+.53
Buy 1 $16 Put	$1.09	$1,090	−.47
Net Debit	$2.18	$2,180	
Net Delta			+.06

Maximum Risk:	$2.18 per barrel or $2,180 per straddle
Maximum Profit:	Unlimited in either direction
Breakeven Futures Prices:	$18.18 and $13.82



Short Put:
In exchange for the premium received, t writer of a put option is obligated to buy t underlying futures at $15 per barrel, an time prior to expiration, if assigned. Thi position realizes maximum profits if futur are trading at $15 or above at expiratio Profits are limited to the premium receive while risk is unlimited on the downside. Declining volatility is favorable to this trade, as is the passage of time.

Long Straddle:
A long straddle is a combination of a lo put and long call with the same strike pri and expiration date. Long straddles are al called long volatility trades because the position profits when the market moves sharply in either direction. Profits are unlimited in either direction. Losses are limited to the total premium paid. Maximu risk is $2,180 and occurs if futures are at $ per barrel at expiration. This trade might established ahead of a scheduled release economic information or before an OPE meeting, in anticipation of increased market volatility.

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Choice of Futures vs. Options Depends on

.... Assessment of the likely direction and magnitude of price change over a given time period.

.... Choice implies time-specific price/probability assessments.

.... Liquidity of each instrument at various price levels (e.g., exposure in futures position to "limit" price moves).

.... Preference for maintaining options position vs. liquidating futures and re-establishing position.

.... Loss exposure is the premium (cost) of options vs. the potential loss on the futures position (assuming a managed hedge). Is premium so high that a managed futures position provides a more cost-effective strategy? Depends on perceived volatility.

Basic Decision Rules for Selecting Strike Prices
(i.e., Option Series)

Market View

Direction	Magnitude	Preferred Strategy
Bullish	Large	Buy out of the Money Calls Sell in the Money Puts
Bullish	Small	Buy in the Money Calls Sell out of the Money Puts
Bearish	Large	Buy out of the Money Puts Sell in the Money Calls
Bullish	Small	Buy in the Money Puts Sell out of the Money Calls

Weighing market view against prevailing premiums will ultimately determine the selecting of the appropriate strike price.

Parameters of Price Change

Three key variables affect option prices or premia:

1) level of strike price relative to the underlying price
2) the implied volatility of price movement
3) time till contract expiration or contract term

Four measures have emerged to capture these determinant of price:

Delta - percent change in the option premium relative to the underlying futures price. Measures the percent equivalent of an option position vis-a-vis a futures position.

Gamma - the rate of change of the delta value with respect to the change in the underlying price (i.e., delta = first derivative of premium with respect to underlying price, gamma = second derivative of this function). Measures the rate of change of the futures-equivalent option position with respect to the underlying price.

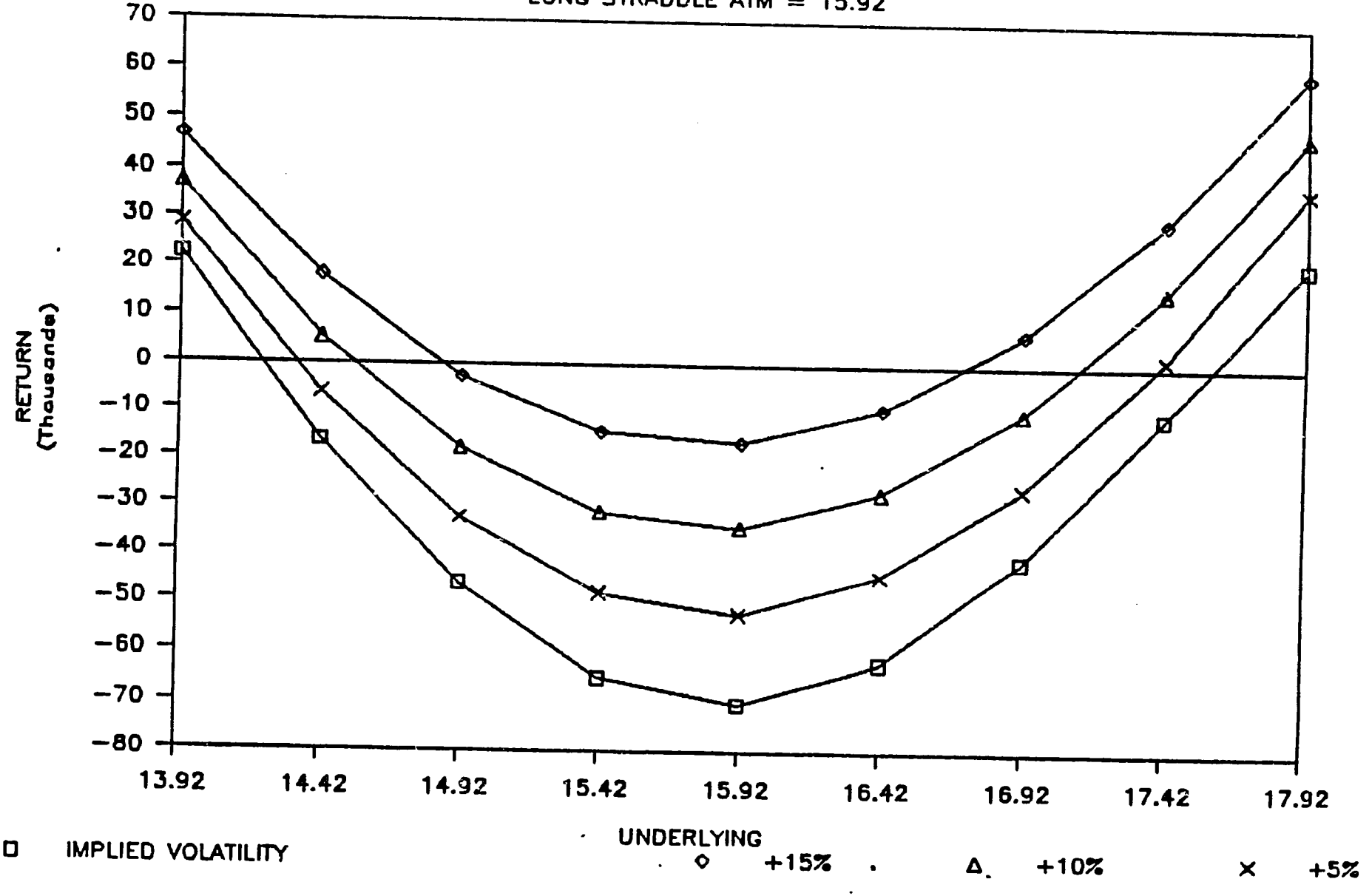
Vega - change in option premium due to a change in implied volatility (i.e., $ value change per % change in implied volatility).

Theta - change in option premium due to passage of one day's time (i.e., $ value decline in position per day of time elapsed).

Each of these parameters are a function of the strike vs. price and time till expiration (e.g., vega varies depending on underlying prices and time expiration).

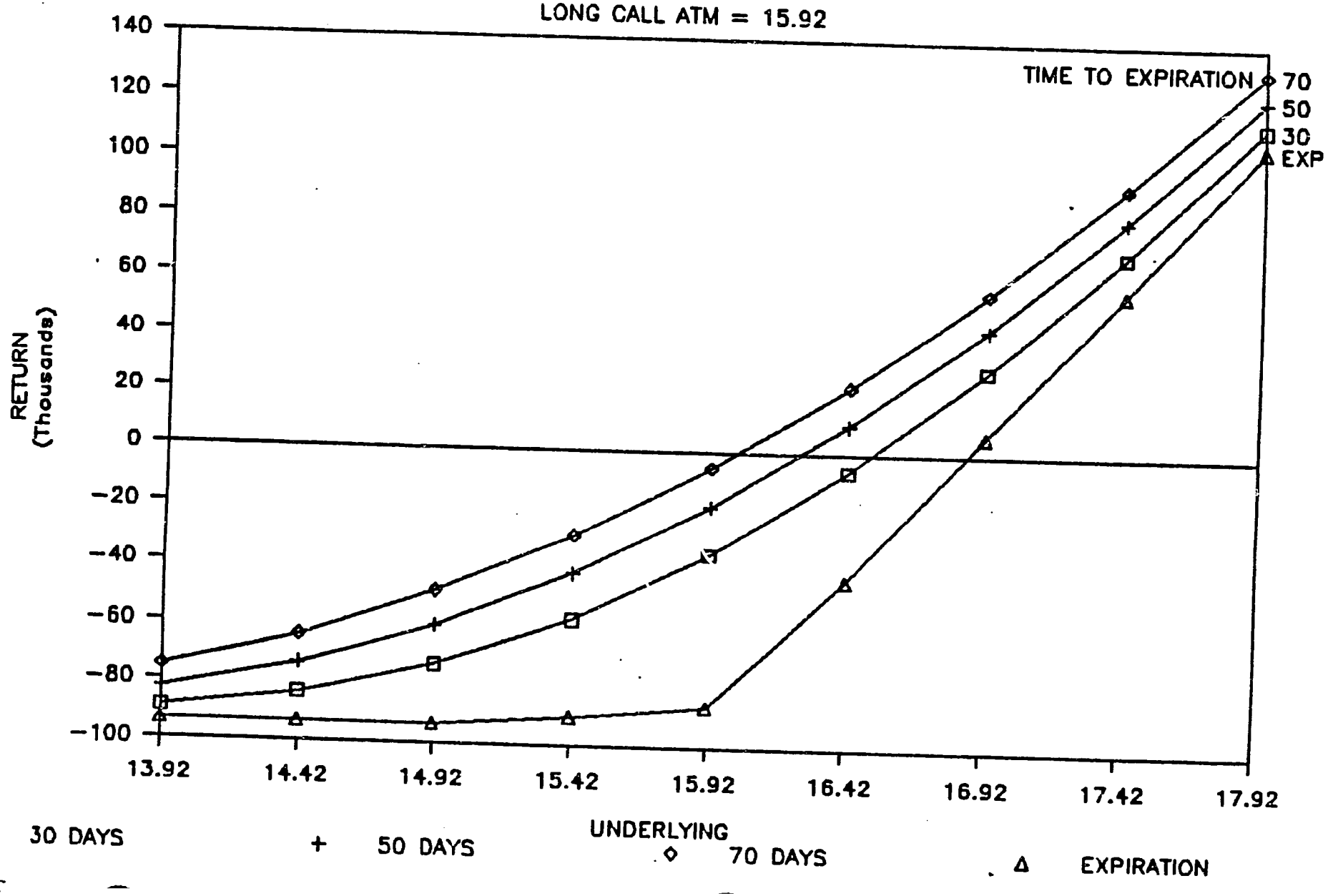
EFFECT OF VOLATILITY ON OPTION RETURNS

LONG STRADDLE ATM = 15.92



EFFECT OF TIME ON OPTION RETURNS

LONG CALL ATM = 15.92



Strategy Alternatives

I) Outright Buying or Selling (Writing) Options

A) Buy Call - Bullish

B) Sell Call - Bearish

C) Buy Put - Bearish

D) Sell Put - Bullish

II) Synthetic Futures Strategies or Fences

A) Synthetic Long Futures (Bullish)
= Long Call + Short Put

B) Synthetic Short Futures (Bearish)
= Long Put + Short Call

C) Covered Option Strategies or Taking Option Position Opposite of Underlying Cash or Futures Position

COVERED OPTION STRATEGIES

STRATEGY		OPTION POSITION		UNDERLYING COMMODITY POSITION	MOTIVATED BY
Covered Call Sale	=	Short Call	+	Long Commodity	Neutral to Slightly Bullish
Covered Put Sale	=	Short Put	+	Short Commodity	Neutral to Slightly Bearish
Synthetic Call	=	Long Put	+	Long Commodity	Bullish
Synthetic Put	=	Long Call	+	Short Commodity	Bearish

SYNTHETIC FUTURES STRATEGIES

(FENCES)

Synthetic Long Futures = Long Call, Short Put (Bullish)

Synthetic Short Futures = Long Put, Short Call (Bearish)

Option Strategy Spectrum

Absolute Price Expectations

Bullish	Neutral	Bearish
Long Cash Long Futures Synthetic Long Futures Long Call Synthetic Call Short Put (ITM, ATM) Covered Call Sale (OTM)	(Falling Volatility) Short Put (ATM, OTM) Short Call (ATM, OTM) Synthetic Combinations Covered Call Sale (ATM) Covered Put Sale (ATM) Sell Straddle Sell Strangle	Short Cash Short Futures Synthetic Short Futures Long Put Synthetic Put Short Call (ITM, ATM) Covered Put Sale (OTM)
Bull Call Spread Bull Put Spread	Call Ratio Spread Put Ratio Spread Long Butterfly Long Condor (Rising Volatility) Call&Put Ratio Backspreads Buy Straddle & Strangle Short Butterfly & Condor	Bear Put Spread Bear Call Spread

The keys to effective implementation of option strategies are several-fold:

1) Reliable indicator systems for determining both the directional and volatility trend of price movements,

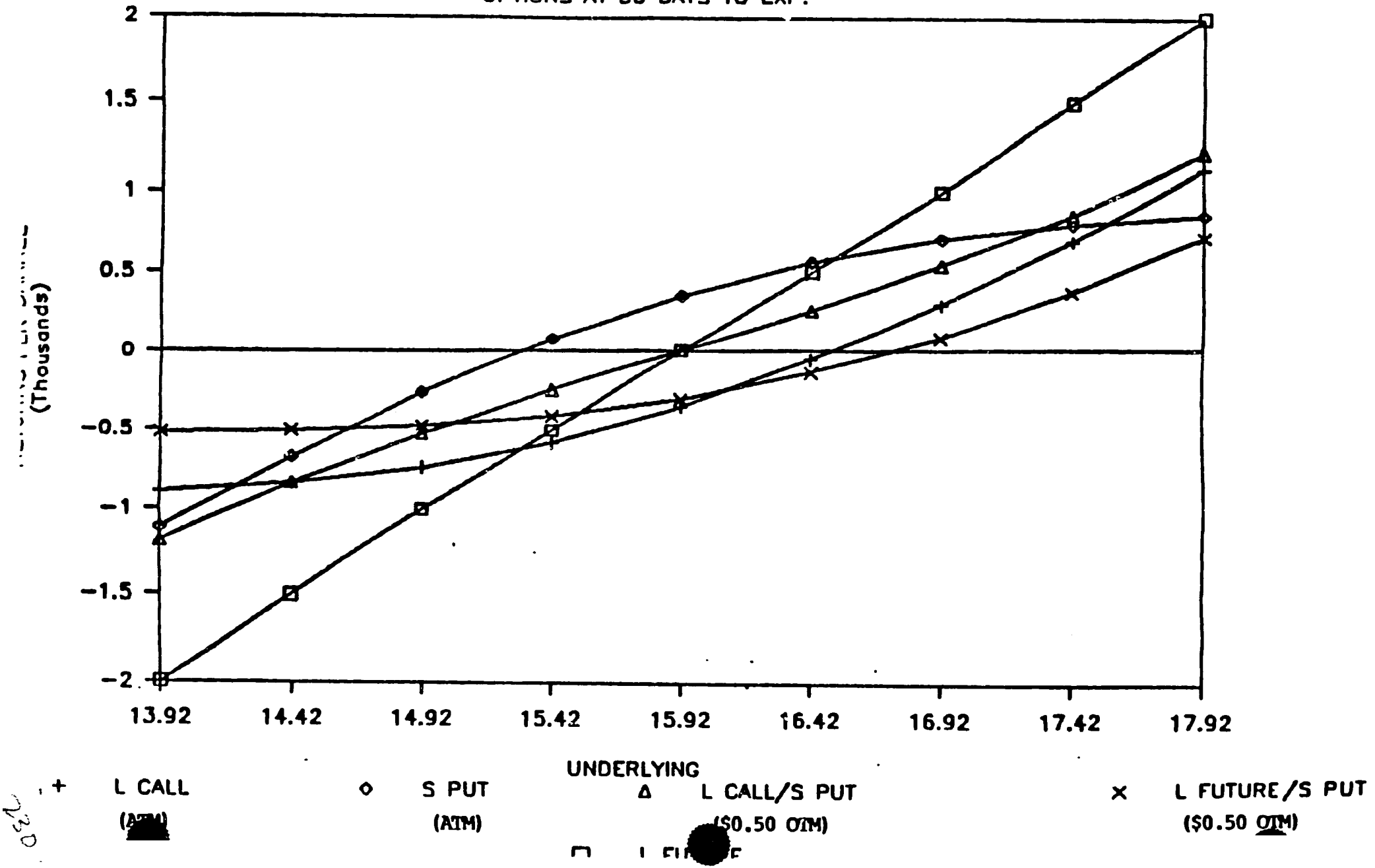
2) Knowledge of the range of portfolio (i.e., outright, spread, futures and option) combinations available,

3) Capability to quantify the return profiles of alternative strategies under various price, volatility and timing scenarios,

4) Ability to adjust position in response to changing price and volatility conditions (i.e., as indicators or actuals change).

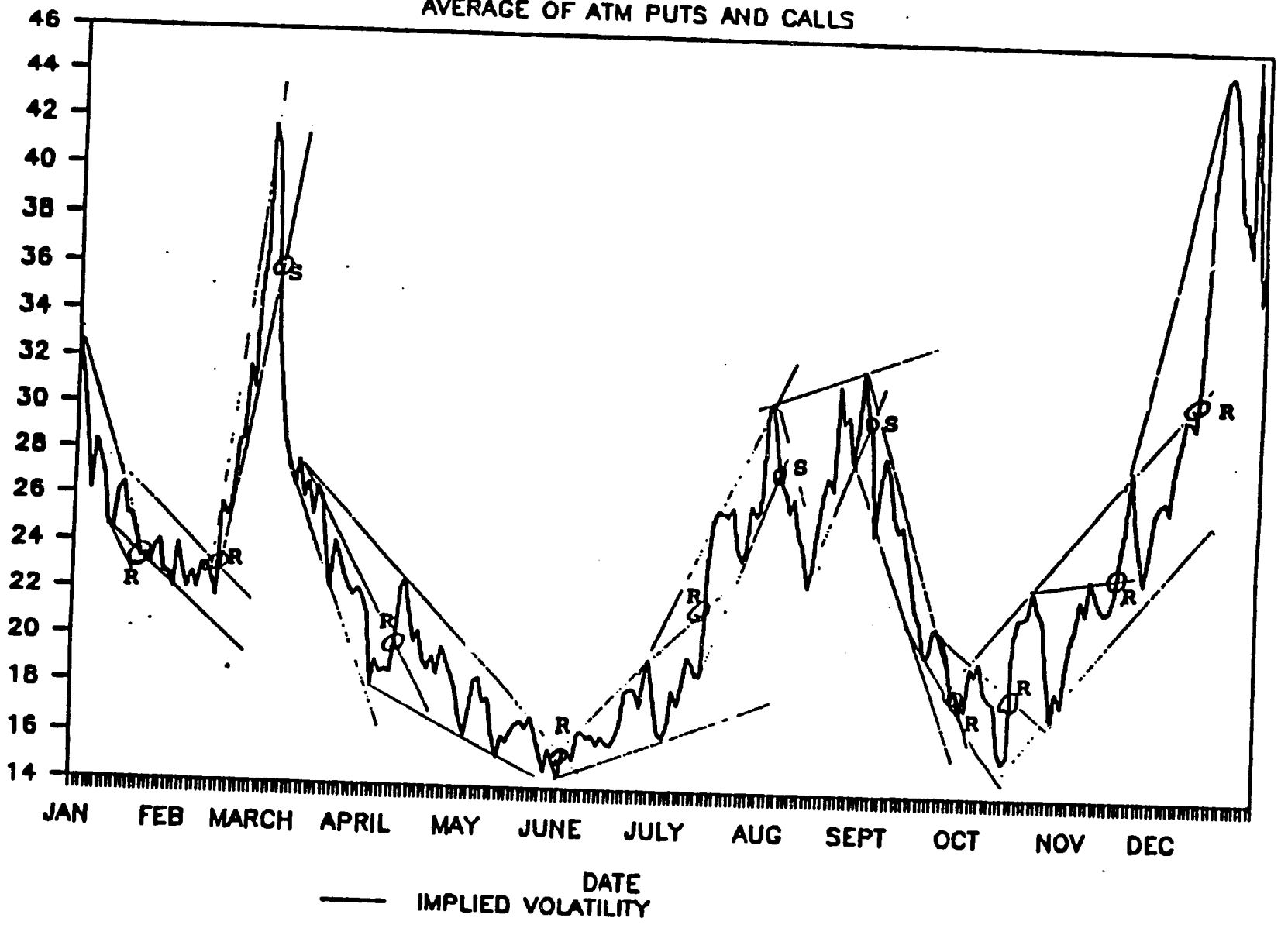
RETURN PROFILE ON BULLISH POSITIONS

OPTIONS AT 30 DAYS TO EXP.



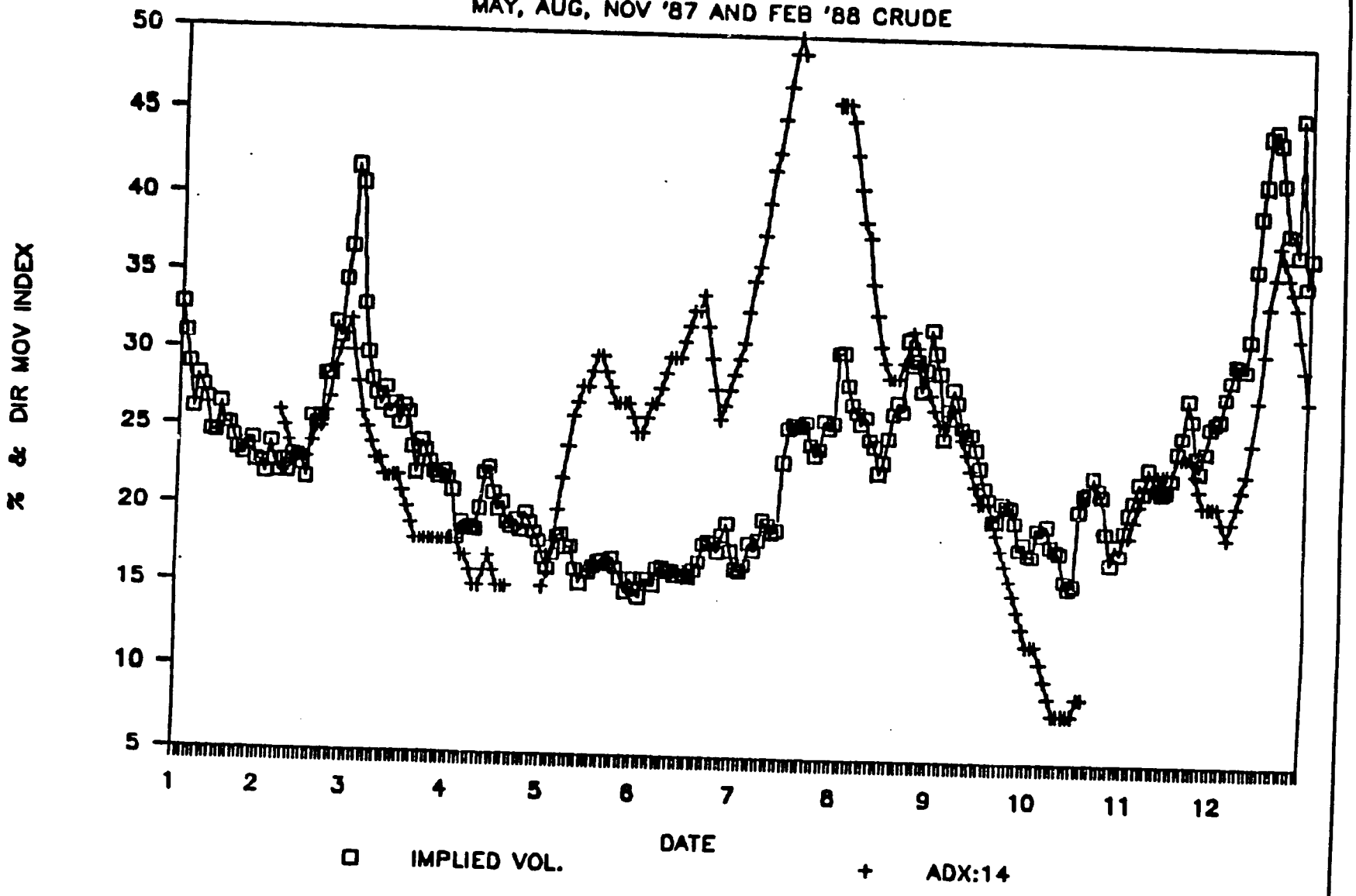
CRUDE OIL IMPLIED VOLATILITY: 1987

AVERAGE OF ATM PUTS AND CALLS



DIR. MOVEMENT (ADX:14) VS. IMPL. VOL.

MAY, AUG, NOV '87 AND FEB '88 CRUDE



WHAT IS A SWAP?

A STREAM OF INCOME DETERMINED BY REFERENCE TO THE PRICE OF A COMMODITY OR OTHER INDICATORS OVER AN AGREED TIME FRAME.

ALTERNATIVELY PUT

BUYING OR SELLING ON A FIXED PRICE TO BE REVERSED AT A LATER DATE ON A PUBLISHED PRICE BASIS FOR CASH SETTLEMENT.

12th JULY PRICES:

DELIVERY MONTH	PRICE $/BBL
DATED	20.00 (JULY)
JULY	20.00
AUGUST	19.00
SEPTEMBER	18.00

LAST THIRD OF PRICE: 23.10 ($20.00 + 3.10)

FINAL PRICE = (21.60 + 22.85 + 23.10) /3 = 22.52

CATEGORIES OF SWAPS
(OR DERIVATIVE PRODUCTS)

1. LONG DATED CRUDE OIL SWAPS

2. SHORT/MEDIUM TERM PRODUCT SWAPS

3. HIGHLY SPECIFIC OIL INDUSTRY SWAP MARKETS

   - DATED/PAPER CFD MARKET
   - FIXED/FLOATING SWAP MARKETS

4. OTHER DERIVATIVE INSTRUMENTS

   - BONDS WITH WARRANTS ATTACHED
   - FORWARD "TRUST" OFFERS

USERS OF SWAPS AND WHY

Energy Consumers:
(Short)

Airlines, power utilities, transportation companies, hauliers, bus companies, etc

Need to lock in energy costs for competitive and planning purposes. Also company can take a medium-/long-term view on fuel costs.

Energy Producers:
(Long)

Exploration and production companies

Need to lock in future prices of energy stream or new developments that can only be financed with a guaranteed return on investment

Manufacturers:
Refiners

Have the opportunity to lock in all or part of the future refining margin thereby guaranteeing a certain return

SHORT/MEDIUM TERM PRODUCT SWAPS

Main users

- Airlines
- Transportation Companies
- Utilities

Example

MS sell fixed price Singapore Bunker Fuel to shipowner period November 1991 – June 1992

A. Price $80

B. Shipowner charters out vessel to Taiwanese coal importer at a set rate with no bunker escalation clause based on a fixed price of $82.

C. When Shipowner passes Singapore each month and buys physical bunkers, he sells back his paper hedges to MS reference Platt's bunker prices.

(B – C) – A = $2 per tonne profit to Shipowner

WHAT ARE THE RISKS?

- UNCLEAR OBJECTIVES
- BASIS RISK
  - * QUALITY
  - * TIMING
  - * LOCATION
- LIQUIDITY
- FINANCIAL POSITION OF YOUR COUNTERPARTY
- COMPETITIVE POSITION
- LACK OF OIL EXPERTISE

ENERGY SWAP MARKET:

Deals Characterized by:

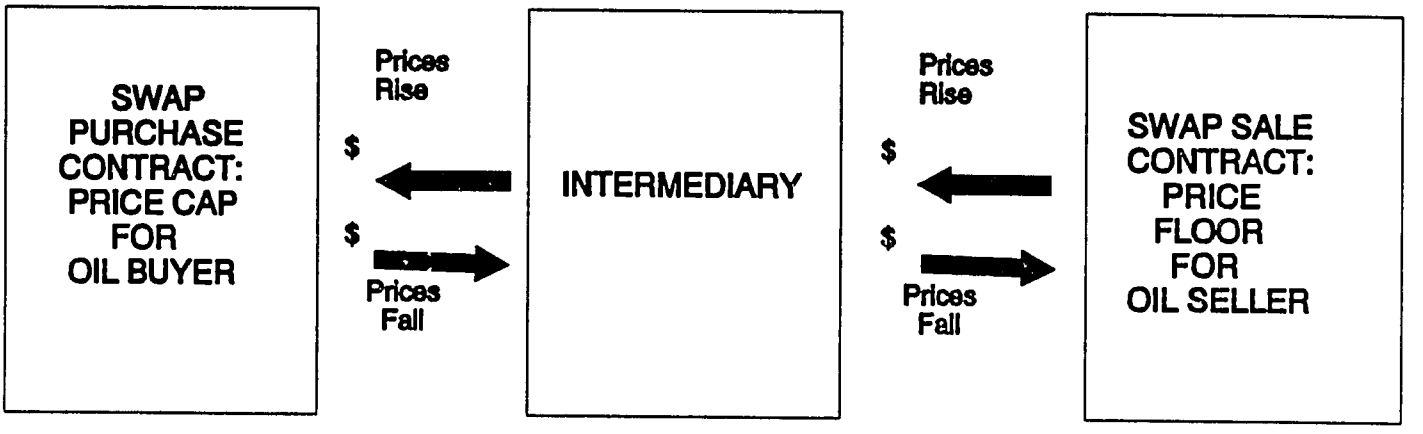
- FUTURES OR OPTIONS - TYPE PRICE INSURANCE
- LONG TERM (1-10 years)
- NEGOTIATED CONTRACTS, NOT STANDARDIZED
- CREDITWORTHINESS CRITICAL
- NOT REGULATED
- NO CENTRAL EXCHANGE

Deals Offered by:

Phibro (Salomon Bros.)	C. Itoh
J. Aron (Goldman Sachs)	Merrill Lynch
Morgan - Stanley	Midland Montagu
Louis Dreyfuss	Morgan Grenfell
Hedge Oil (Elf)	Nomura International
Bankers Trust	Wardley-Thomson Limited
Chase Manhattan	Bankers Trust
Banque Paribas	Banque Indosuez
Shearson American Express	Barclays Bank
First Boston	British Petroleum
Continental Bank	Cargill Investor
AIG Financial	Chemical Bank
Citicorp	

BASIC SWAP STRUCTURE

(Offsetting Contracts)



Swap Terms:

Swap Sale Contract at $20/BBL.

Swap Purchase at $20.20/BBL.

Period - 3 Years

Volume - 50,000 BBL./DAY

Payment* - Difference between swap
- price monthly average
of price reference

Price Reference - NYMEX DAILY
SETTING PRICE
less $.60/BBL

* Purchaser receives (seller makes) payments - $/BBL. amount which the variable price reference exceeds the fixed swap price, purchaser makes (seller receives) payments - $/BBL. amount by which the variable reference price falls below the swap price.

COMMODITY-INDEXED TRANSACTIONS

- FIXED-FOR-FLOATING COMMODITY SWAPS
- COMMODITY PRICE "CAPS", "FLOORS" & "COLLARS"
- BASIS SWAPS
- COMMODITY-INDEXED FINANCING & SECURITIES
- STRUCTURED FINANCE
- INVESTMENTS

ROLE OF THE SWAPS DEALER

- PRINCIPAL IN TRANSACTIONS
- ASSUMPTION OF CREDIT RISK (TWO-WAY)
- DEAL ANALYSIS, STRUCTURE & EXECUTION
- CONFIDENTIAL COUNTERPARTY
- POSSIBLE DEBT OR EQUITY INVESTOR
- RISK ARBITRAGE
  (CREDIT, GEOGRAPHY, BASIS, MARKETS)
- PROFITS FROM DEALS BASED ON RISKS MANAGED

Swap Portfolio Development
Intermediaries;
Sellers and Buyers

Sellers of Fixed Price Commodity

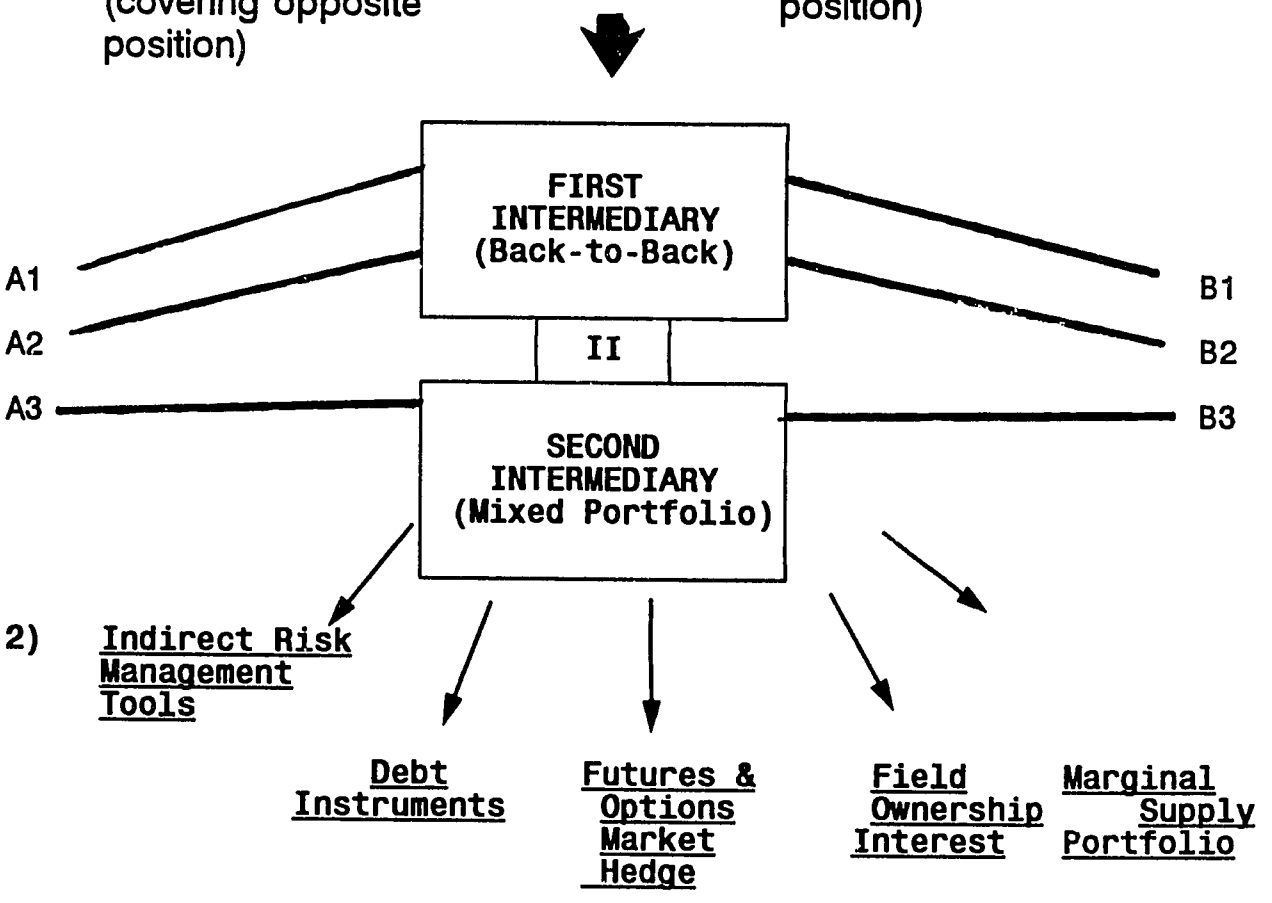
Buyers of Fixed Price Commodity Insurance (B)

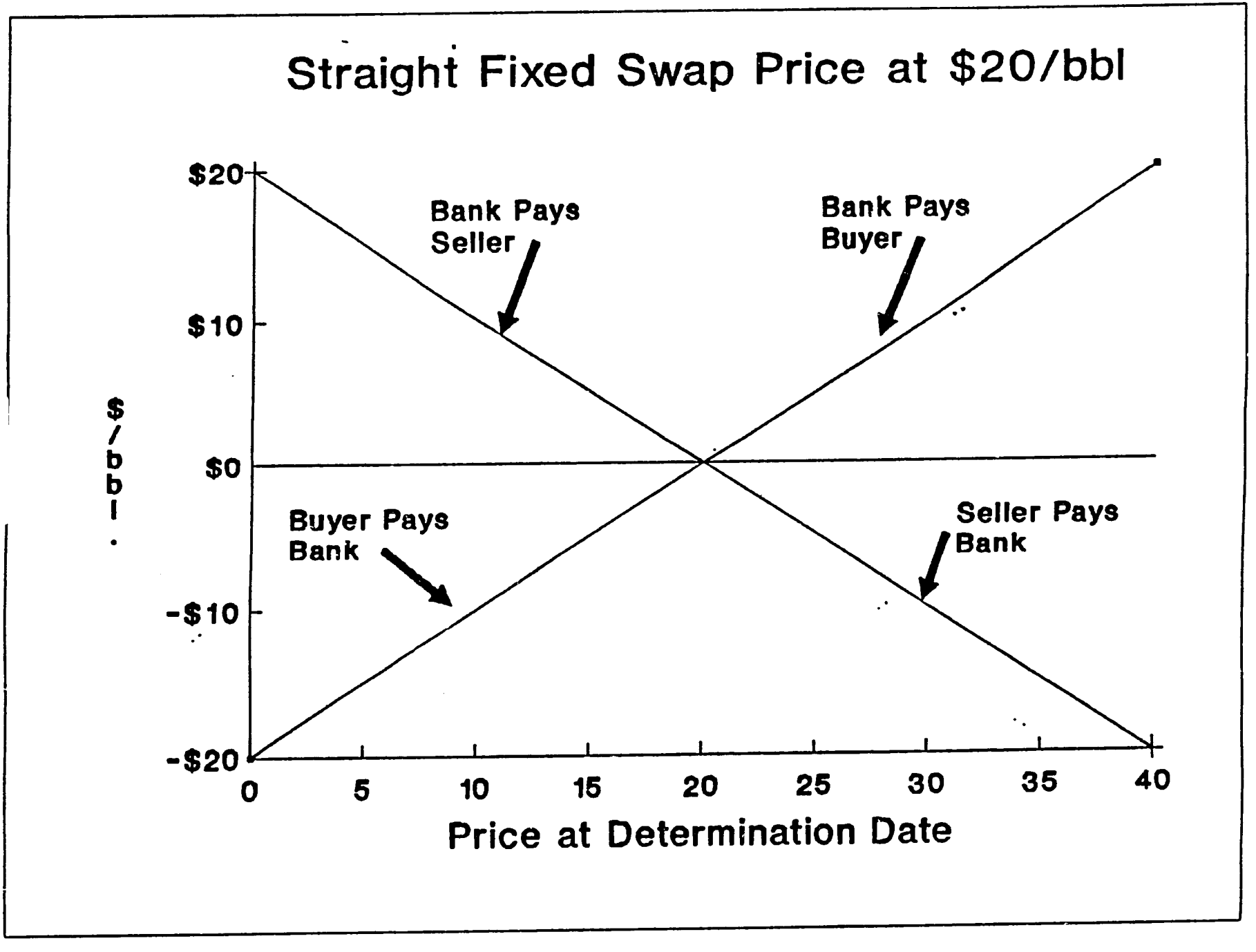
1) **Direct Contracts**

Financial Firms (upside or downside)

Energy Firms (covering opposite position)

Producers (downside)
End-users (upside)
Financial Firms (covering opposite position)




Straight Fixed Swap Price at $20/bbl
$20
$10
$0
-$10
-$20
$/bbl.
Bank Pays Seller
Bank Pays Buyer
Buyer Pays Bank
Seller Pays Bank
0
5
10
15
20
25
30
35
40
Price at Determination Date

VARIATIONS TO THE BASIC SWAP PRICE AND VOLUME STRUCTURE

Price Variations:

- Standard Fixed Price Swap with Linear Return Profile

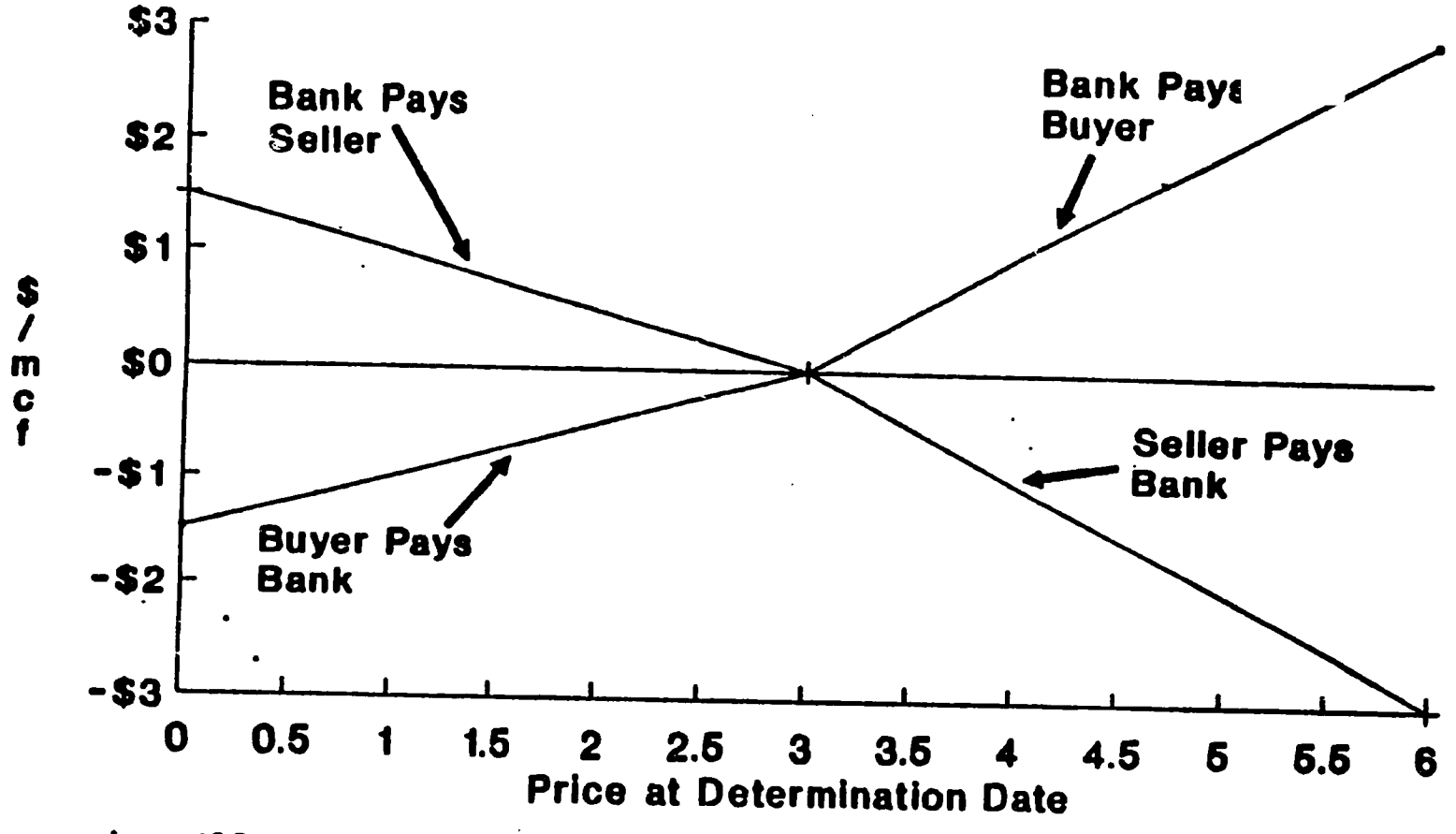
- A Fixed Periodic Escalator (e.g., 5% Annum), Producing a Swap Price Ray or "Ratchet"

- A Percent of Escalation Arrangement Whereby Buyer and Offeror's "Percent of Price Participation" Beyond a Pre-Specified Price is Negotiated

  (Begins to Introduce Option Valuation Procedures ... i.e., the Anticipated Volatility of Price Movement As Well as its Expected Direction and Level)

- A Pure Option (Cap and/or Floor) Price Structure, whose Valuation is Linked Directly to Implied Volatility

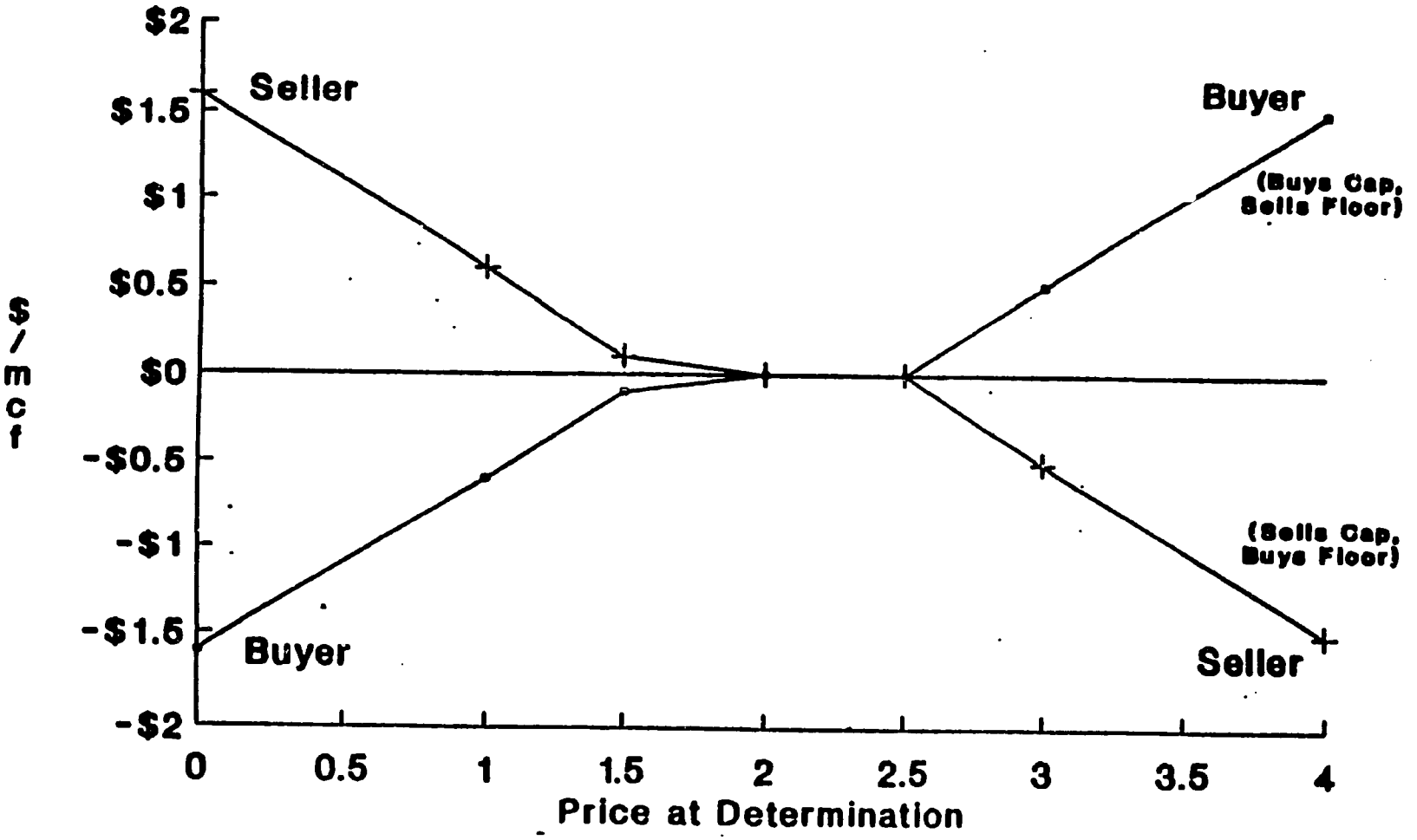
B) 100% Escalation to Buyer, 50% to Seller, with Swap Price @ $3/mcf



Buyer receives 100% of each $ of upside movement, pays 50% to seller for each $ downside

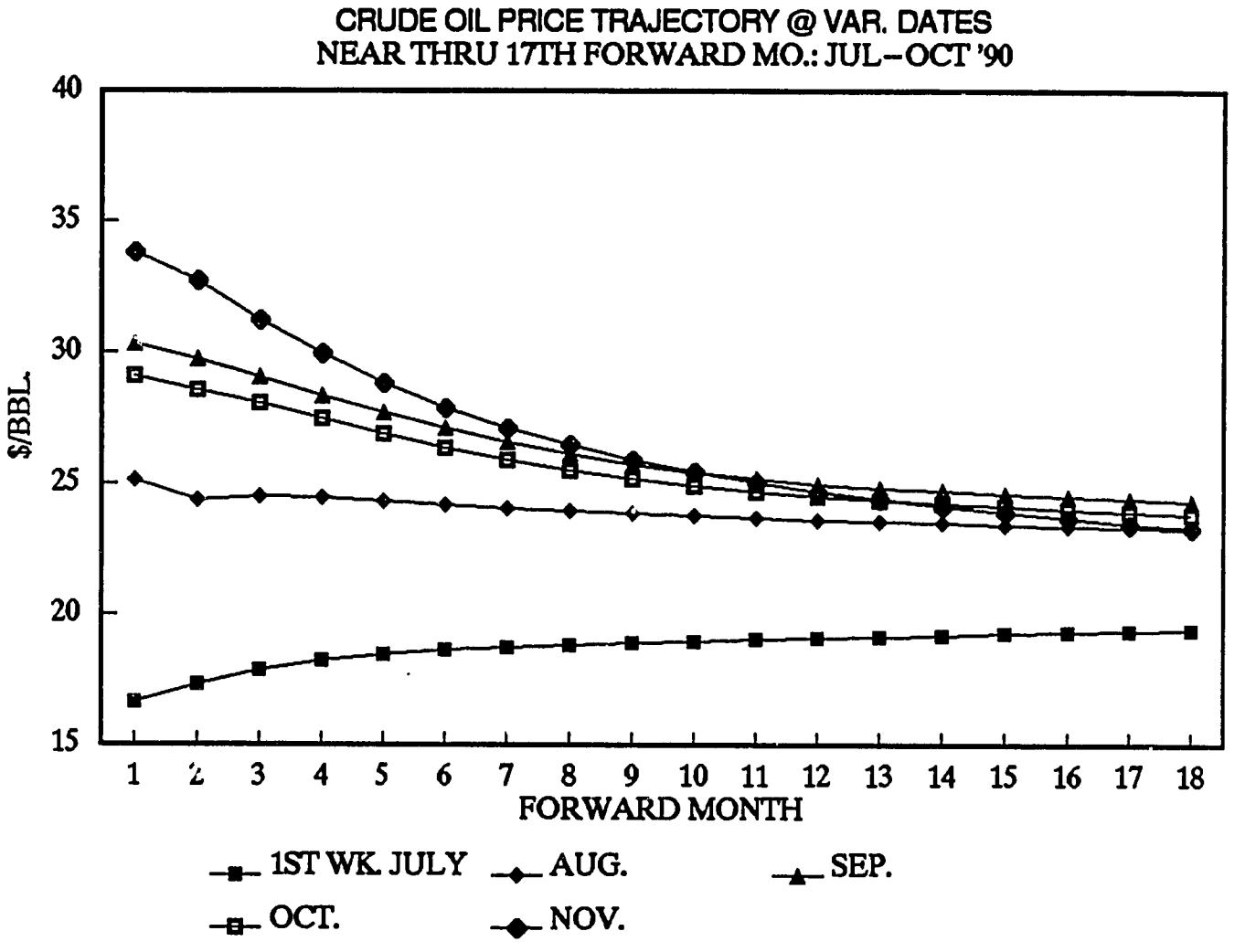
FIGURE IV-3 (cont.)

C) Collar: Cap @ $2.50/mcf and Floor @ $1.60 MCF Each with a Premium of $0.50



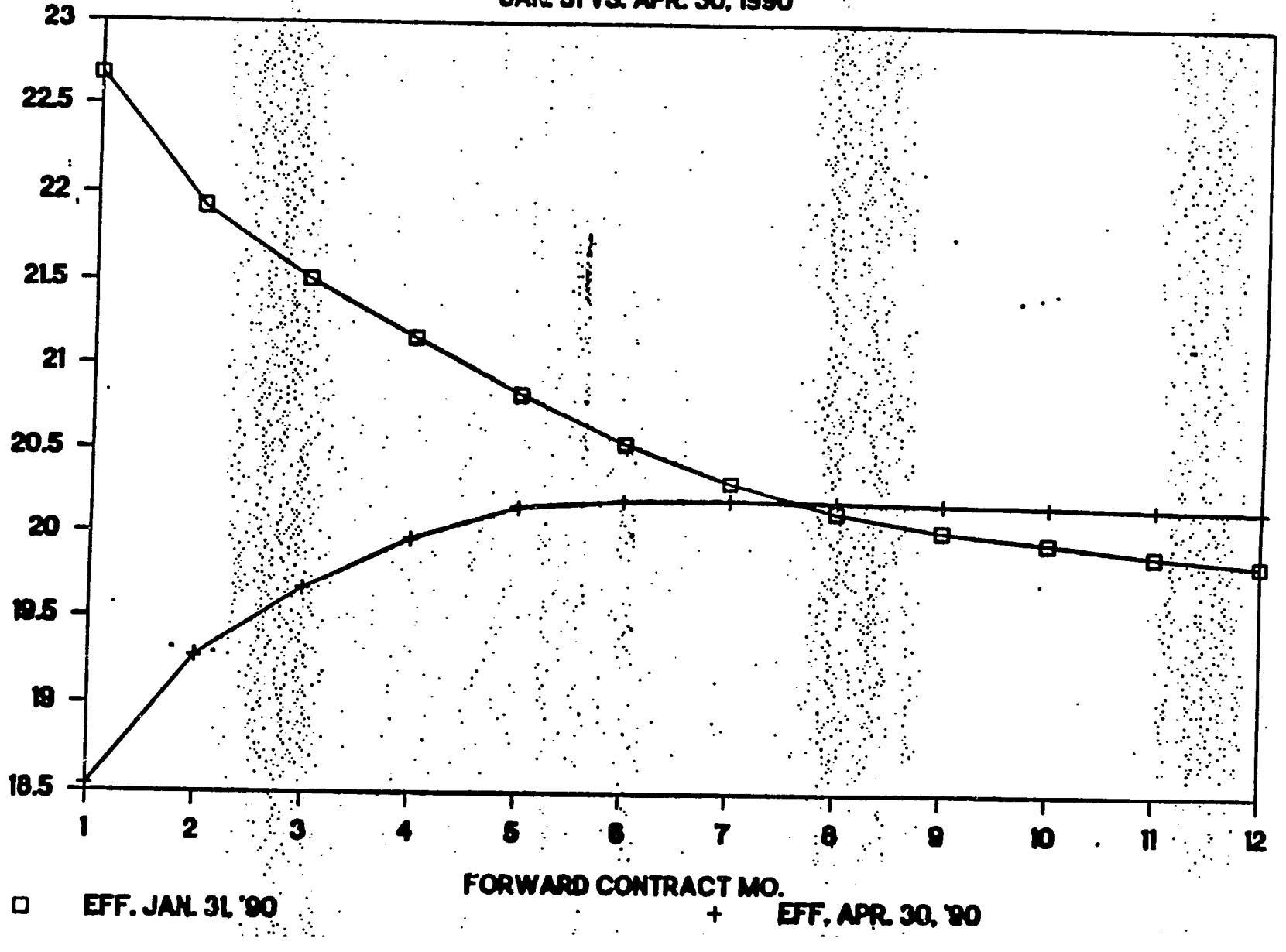
PRICING THE SWAP

- Swap Price relative to Forward Price Curve
- Factoring in Time Value of Money
- Swap Price vs. Projected Commodity Price and Cost of Money
- Implicit Option Premium Cost, Hence Implied Volatility, Built into C Floor and "Collar" Prices
- Factoring in Performance Risk and the Duration of the Contract
- Apparent Market-Maker's Margin vs. Cost of Direct Hedge Execu and Management


CRUDE OIL PRICE TRAJECTORY @ VAR. DATES
NEAR THRU 17TH FORWARD MO.: JUL–OCT '90
$/BBL.
40
35
30
25
20
15
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
FORWARD MONTH
1ST WK. JULY
AUG.
SEP.
OCT.
NOV.

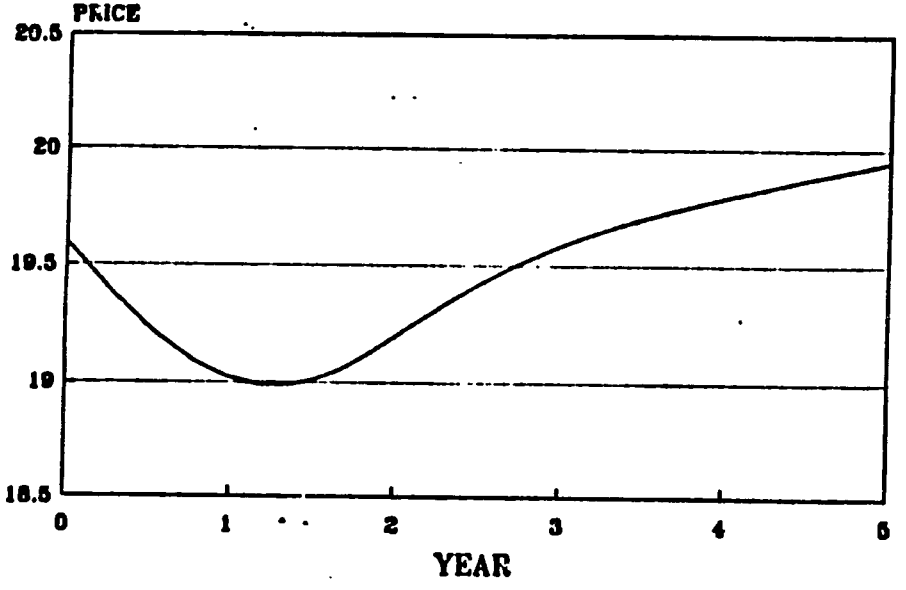
CRUDE FUTURES PRICE TRAJECTORIES

JAN. 31 VS. APR. 30, 1990

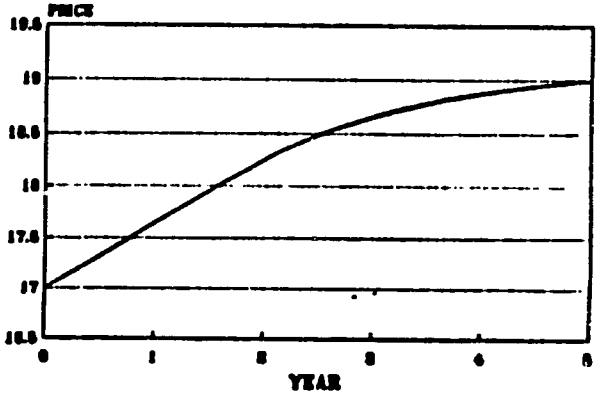


ALTERNATIVE SHAPES OF THE FORWARD PRICE CURVE FOR LONG TERM OIL "SWAPS"

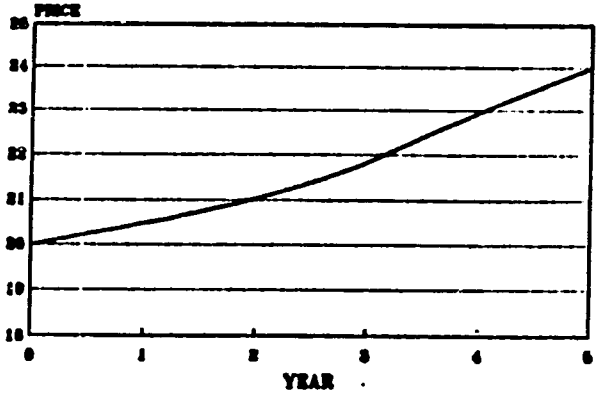
(A) CURRENT (STRONG PROMPT, FORWARD DISCOUNT)



(B) WEAK PROMPT MARKET
(CARRYING CHARGE FOLLOWING PRICE COLLAPSE)



(C) LONGER RUN CONSTRAINED CAPACITY VIEW
(CONVEX CURVE)



Derived 5-Year Crude Oil Swap Market Forward Price Trajectory for Long Hedge

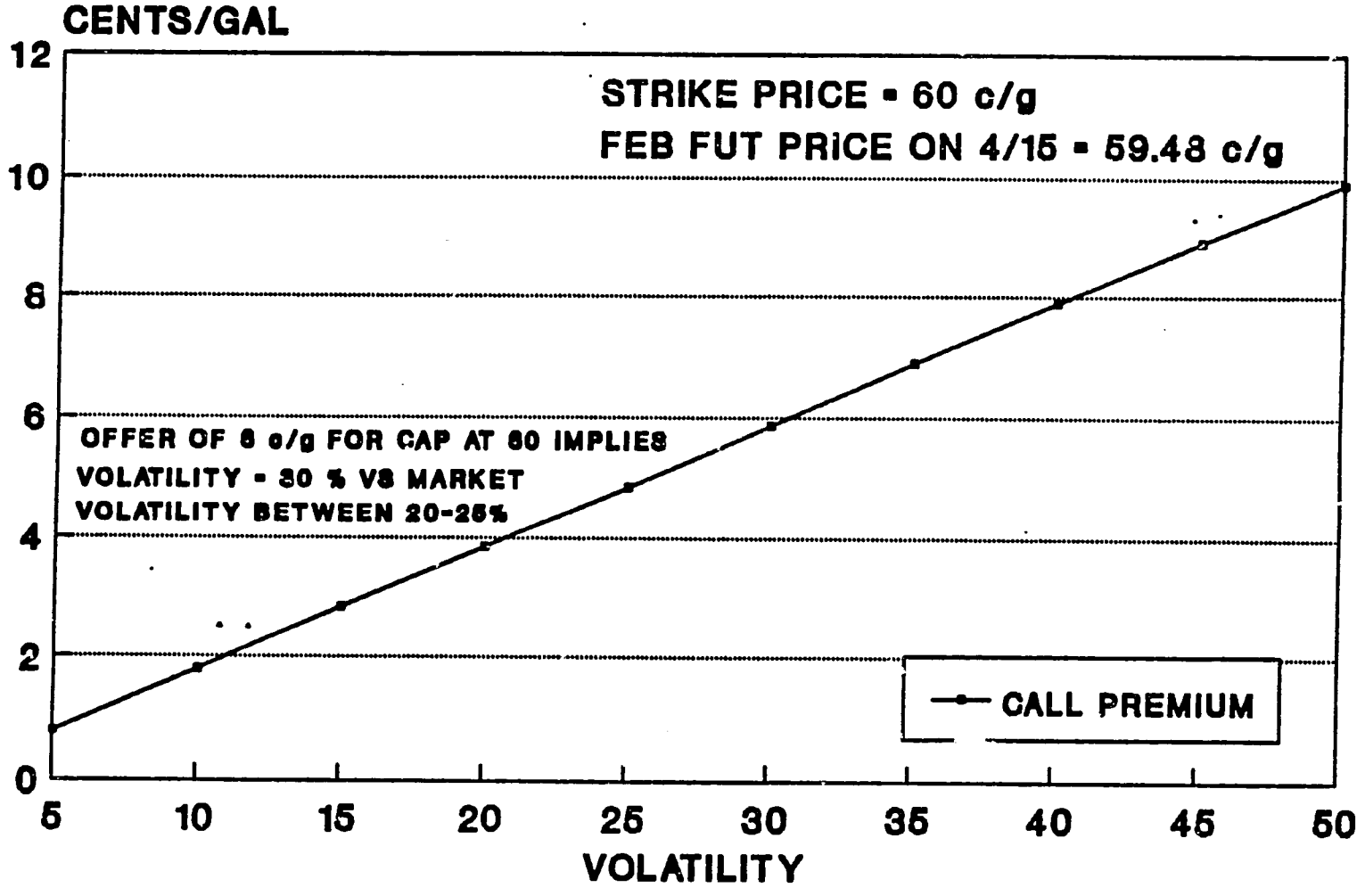
(Demonstrating Role of Time Value in Swap Price Determination)

Year	Projected Average Price (Nominal $/BBL)	5-Year Swap Price	Swap - Projected Prices (Margins) ($/BBL)	1994 Nominal Margin Compounded @ 10% Per Annum	Cum. Value of Swap ($/BBL)
1989	$19.40 (spot)	$20.00	N/A		
1990	$18.50 (avg.futures)	"	$1.50	$2.20	$2.20
1991	$18.50	"	$1.50	$2.00	$4.20
1992	$19.50	"	$0.50	$0.61	$4.81
1993	$21.00	"	-$1.00	-$1.10	$3.71
1994	$22.90	"	-$2.90	-$2.90	$0.81

1990-94 Avg. = $20.08

Assumes: Swap volumes are spread equally between forward years 1-5 (i.e., 20% per year), although in practice the hedger will stack 100% of the volume in year 1, rolling 80% to year 2, 60% to year 3, 40% to year 4, etc. To the extent that prices move up from the original forward price curve shown, it is assumed that the gains in the stacked (nearby year) hedged position will precisely offset the higher hedge price to be established in the forward years (i.e., no change in the time spread or shape of the forward curve).

#2 OIL: VOLATILITY & CALL PREMIUMS
FEB CALL TRADING ON 4/15/91



THEORETICAL OPTION PREMIUMS FOR WINTER HEATING OIL COLLAR
MAY 23, 1989

	MONTH	DAYS TO EXPIRE	FUT PRICE (F)	PUT PREMIUMS F-5	F-4	F-3	F-2	F-1	F	CALL PREMIUMS F	F+1	F+2	F+3	F+4	F+5
CASE 1: ASSUMED PRICE VOLATILITY = 25 %	JAN	199	49.09	1.49	1.82	2.20	2.62	3.09	3.61	3.61	3.17	2.77	2.41	2.09	1.80
	FEB	234	48.59	1.70	2.05	2.44	2.88	3.35	3.87	3.87	3.43	3.03	2.67	2.34	2.05
	MAR	262	47.04	1.77	2.13	2.52	2.96	3.44	3.96	3.96	3.53	3.13	2.76	2.44	2.14
CASE 2: ASSUMED PRICE VOLATILITY = 40 %	JAN	199	49.09	3.32	3.75	4.21	4.70	5.22	5.76	5.76	5.33	4.93	4.56	4.20	3.88
	FEB	234	48.59	3.69	4.13	4.61	5.10	5.63	6.18	6.18	5.75	5.36	4.98	4.63	4.30
	MAR	262	47.04	3.81	4.26	4.74	5.24	5.77	6.32	6.32	5.90	5.51	5.13	4.78	4.45

INDICATIVE STRIKE PRICES FOR "SELF-FINANCING" COLLAR ON WINTER '92 #2 OIL PRICES*

PUT			CALL	
STRIKE	VS. AT MONEY	PREMIUM	STRIKE	VS. AT MONEY
58.33	0.00	5.04	58.33	0.00
57.53	-0.80	4.60	59.33	+1.00
56.73	-1.60	4.18	60.33	+2.00
55.93	-2.40	3.80	61.33	+3.00
55.13	-3.20	3.45	62.33	+4.00
54.33	-4.00	3.12	63.33	+5.00

*BASED ON APRIL 10, 1991 RESULTS FOR THE FEB '92 #2 OIL OPTION CONTRACT.

Section 12

Finance

PAYMENT METHODS IN OIL TRADE

- OPEN ACCOUNT
- STANDBY LETTER OF CREDIT / GUARANTEE
- DOCUMENTARY LETTER OF CREDIT

LETTERS OF CREDIT

BUYER OPENS L/C WITH BANK IN FAVOUR OF SELLER

BUYER'S ADVANTAGES

- SELLER HAS TO PERFORM re DELIVERY AND DOCUMENTS TO OBTAIN PAYMENT
- TOOL TO OBTAIN LONGER CREDIT PERIOD

BUYER'S DISADVANTAGES

- LOSS OF FLEXIBILITY
- COSTS

SELLER'S ADVANTAGES

- CREDIT RISK ON BANK

SELLER'S DISADVANTAGES

- SPECIFIC PERFORMANCE REQUIREMENTS TO OBTAIN PAYMENT
- LOSS OF FLEXIBILITY

DOCUMENTARY LETTERS OF CREDIT

- "A CONDITIONAL BANK UNDERTAKING OF PAYMENT AGAINST PRESENTATION OF A SPECIFIC SET OF DOCUMENTS WITHIN A SPECIFIED PERIOD COVERING A SPECIFIC CARGO"
- ALL DOCUMENTS MUST BE IN ORDER FOR BANK TO HONOR LETTER OF CREDIT FOR PAYMENT
- ALWAYS IRREVOCABLE
- SEE BRENT CONTRACT FOR TYPICAL FOR MAT

BALANCE SHEET

THE SECURITY IS THE FINANCIAL QUALITY OF THE COMPANY

ie, ITS BALANCE SHEET

BANK ACCEPTS ANY TRADING EXPOSURE IS LIKELY TO BE COVERED BY NET ASSETS

WHO APPLIES TO?

- MAJORS
- LARGE FINANCIAL HOUSES/INVESTMENT BANKS
- LARGE INDEPENDENT OIL COMPANIES
- LARGE TRADING HOUSES

BANKING ROLE?

- ARMS LENGTH
- PRICE DRIVEN

WHO DOES TRANSACTION FINANCE APPLY TO?

THOSE WHO CAN'T GET BALANCE SHEET FINANCE, IE:

- TRADERS
- SMALLER OIL COMPANIES

BANKING ROLE

BANK NEEDS TO KNOW:

- THE MARKET
- PRICE TREND
- TYPE OF CONTRACT
- TRADERS' EXPERIENCE

EXAMPLES OF DOCUMENTS REQUIRED FOR DOCUMENTARY LETTER OF CREDIT

ALL ORIGINAL BILLS OF LADING

CERTIFICATE OF QUANTITY

CERTIFICATE OF QUALITY

VESSEL TIMESHEET

ULLAGE REPORT

CERTIFICATE OF ORIGIN/T2L

MASTERS RECEIPT FOR SAMPLES

MASTERS RECEIPT FOR DOCUMENTS

INSURANCE CERTIFICATE

DISCHARGE CERTIFICATE

COMMERCIAL INVOICE

LETTERS OF INDEMNITY

TWO TYPES OF LOIs:

- TO ALLOW FOR PAYMENT WITHOUT PRESENTATION OF BILLS OF LADING/DOCUMENTS
- TO PERMIT DISCHARGE OF CARGO OR CHANGE OF DESTINATION WITHOUT PRESENTATION OF BILLS OF LADING

PURPOSE OF LOIs

- INDEMNIFIES BUYER FOR THE RISK THAT TITLE WAS NOT TRANSFERRED
- INDEMNIFIES AGAINST CONSEQUENCES OF MISSING DOCUMENTS

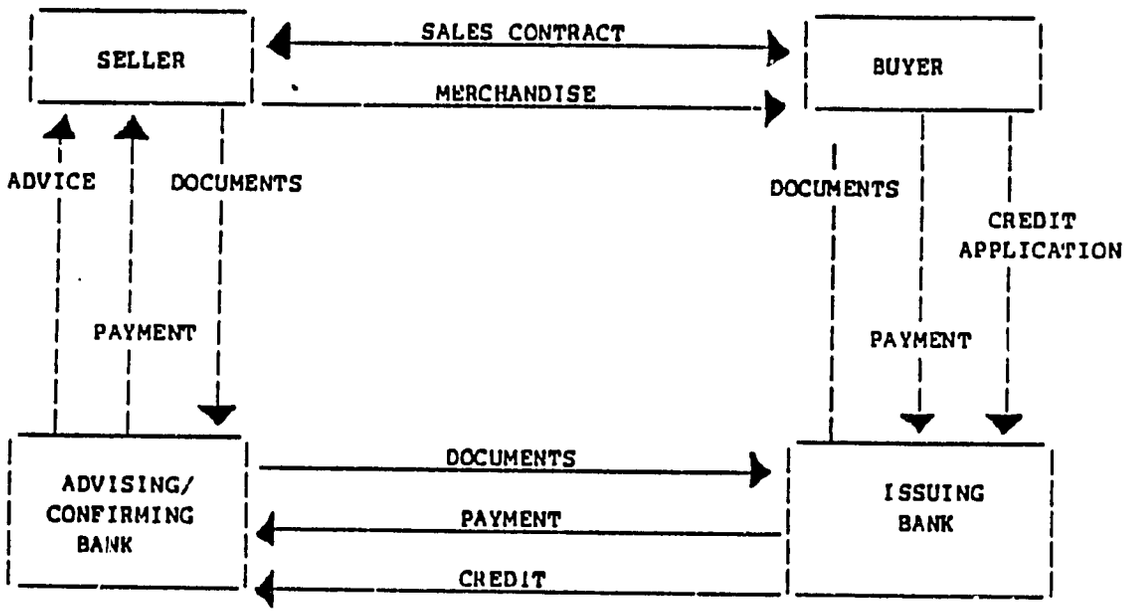
SELLER CAN ISSUE LOI or BANK CAN

- COUNTER SIGN LOI
- ISSUE LOI
- JOINTLY ISSUE LOI
- BANK PREFERS COUNTER SIGNING

N.B. SEE BRENT CONTRACT FOR TYPICAL FORMAT

LETTERS OF CREDIT

PROCEDURE USED IN A LETTER OF CREDIT



LETTERS OF CREDIT: DOCUMENTS

1. General

The bank letter of credit imposes no greater requirement than the buyer would impose on the seller under any other trade terms save that negotiable transport documents must be included if the issuing bank is to obtain security over the documents (which is normally required). This is a key point in the banking system's availment of credits Banks may well be willing to issue payment guarantees wihout security for some of their customers, but certainly not for as many as they will issue letters of credit. The reason is that in extremis the issuing bank sell the merchandise to repay itself because the negotiable transport documents give it title. There may be a loss but not as much as without the merchandise.
Usual transport documents are the following:

1.1 Bill of lading

Details on the bill of lading should include:

i description of the merchandise consistent with the credit
ii vessel's name
iii evidence of loading usually by the imposition of the words "on board";
iv loading and discharge ports;
v names of shipper (the seller) and consignee (the buyer, his agent or sometimes "to order");
vi whether freight is pre-paid or not;
vii the number and date of bills. the date is perhaps the most important requirement. Firstly, it shows whether the goods are shipped within a required time for shipment under the credit; secondly it enables determination of presentation within the validity of the credit or, if no date is specified, 21 days of the date of the bills; thirdly, it permits determination of the acceptability of the accompanying insurance document.

The law affecting bills of lading is fairly complicated but, in essence, these are common sense documents. Any marks or comments on bills should be treated with care. For example, if the credit calls for merchandise to be stowed, and the bills are marked that goods are loaded on deck, they are not acceptable and indeed the insurance cover may not be effective either.

1.4 Common Discrepancies

- Claused (unclean) bills of lading
- Charter party bill of lading
- No evidence of goods actually "shipped on board"
- Shipment made between ports other than those stated in the credit
- Goods shipped on deck
- Presentation of an insurance document of a type other than that required by the credit
- Insurance risks covered not as specified in the credit
- Insurance cover expressed in a currency other than that of the credit
- Under-insured
- Insurance not effective from the date of the shipping document
- Documents inconsistent with each other
- Description of goods on invoice differs from that in the credit
- Marks and numbers differ between documents
- Credit amount exceeded
- Credit expired
- Documents not presented in time
- Late shipment
- Absence of documents called for in the credit
- Bill of exchange drawn on a wrong party
- Bill of exchange payable on an interminable date
- Bills of lading, insurance document or bill of exchange not endorsed correctly
- Absence of signatures, where required, on documents presented
- Bill of lading does not evidence whether freight is paid or not

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Financing oil shipments

Jacques Leuba

1. Introduction

In terms of both physical and financial volume, the international oil trade must be the biggest trade in the world, involving a diversity of companies ranging from the largest multinationals to the smallest offshore and domestic traders. This chapter looks at some of the methods used by bankers lending to companies involved in the international oil trade, and the problems they encounter, concentrating on "transactional" finance.*

Transactional finance signifies lending on the strengths of, and for the sole purposes of doing, a specific deal which does not necessarily require recourse by the lender to a strong balance sheet or to other resources provided by the borrower. Because of the huge amounts involved, the form of finance most used by trading companies is self-liquidating or transactional.

After a general description of international oil markets, several types of transaction are summarized, with consideration of the risks involved. Security available to companies and to their bankers is examined alongside banking procedures and collateral requirements in various commercial situations. The final part of the chapter looks at the constraints faced by banks in enforcing their security, appraising their clients' credit, and limiting their outstandings.

1.1 International oil markets

1.1.1 Types of company

Until the late 1960s, the international production and distribution of crude oil and products was almost entirely the preserve of the largest integrated oil companies, the Seven Sisters, together with some state owned entities such as CFP of France. These companies held title to production concessions in the producing countries and were able, through their control and ownership of extensive tanker fleets, refining plants and marketing networks, to dominate worldwide supplies of oil and the main consumer outlets.

The majors' access to sources of supply was only limited when OPEC countries began to assert their control over their own crude production and sales. As soon as this began to happen, the factors determining worldwide supply and demand were no longer the prerogative of the majors, and other types of company were able to gain access to what had been a cornered market. Four broad categories of company were now able to trade internationally on a scale unprecedented before the advent of OPEC:

a. **National companies of the producing countries**, OPEC and non-OPEC, principally as sellers of crude but also increasingly, through the acquisition of their own refining and distribution networks, as powerful integrated companies in their own right;

b. **State owned oil companies of industrialized countries**, and the Japanese state controlled trading companies. These companies concluded very substantial government to government contracts with the producing countries taking up around 40% of the total crude moved.

c. A wide spectrum of **privately owned oil companies**, from the huge fully integrated majors down through smaller and less integrated majors or "mini-majors" to companies based in local markets alone, with one or a combination of refining, distribution or marketing facilities.

d. **Independent trading companies.** Though of considerable variety, one could define the "pure" trading company as one which does not depend on fixed assets for its trading activities, but relies rather on its expertise and contacts to provide a service of supply to or offtake from the larger companies, equating in this way the imbalances of demand and supply resulting from the rigidities of the market. "Independent" signifies unconnected with other companies involved in production, refining or distribution. Trading companies obviously exist across these distinctions. Some are owned by large industrial groups; others are independent but serve a specific associated interest in supply or consumption. Often even the "purest" traders may expand into companies possessing considerable shipping, storage, or marketing facilities of their own.

Markets in different types of crude and product are so specific that trading companies or the traders they employ often specialize in one area such as Middle

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* The author gratefully acknowledges the guidance provided by Christian Wever, head of Paribas Suisse's banking division, who has been responsible for some of the principal developments in the field of oil trade financing in recent years.

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East or African crudes, or naphtha or gasoline, or fuel oil. Only the bigger trading companies can afford to have traders competent across the spectrum and even then the tendency would be to subdivide activities into well defined geographical areas.

Oil companies can to some extent be classified functionally according to the extent and type of vertical integration they exhibit. Some companies are both part-integrated (with a refinery or marketing outlets, production, or a combination) and part-trader.

In considering the financing of the oil trade we will be chiefly looking at the independent trader, since it is this type of company that needs to raise finance on a solely "transactional" basis, without being able to offer the traditional security of large balance sheet, steady cash flow and mortgageable fixed assets which would normally be expected for the large borrowing involved.

1.1.2 The international spot market

Changes in the international market resulting from the OPEC cartel caused a shift from buying and selling crude and products mainly on a term basis (contracts fixed over months or years) to greater reliance on the spot market.

Though most of the crude moved, say about 80%, is still dealt with on a term basis, this percentage has

Exhibit 12.3. Refinery crude oil throughputs and trade, 1972–82

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	Yearly change 1982 over 1972 (%)	Yearly change 1982 over 1977 (%)
Refinery crude oil throughputs						Thousand barrels daily							
US	11,835	12,555	12,280	12,475	14,435	14,625	14,780	14,465	13,520	12,470	11,775	−0·1	−4·2
Canada	1,535	1,675	1,765	1,700	1,710	1,805	1,820	1,960	2,085	1,945	1,715	+1·1	−1·0
Latin America	5,445	5,970	5,890	5,515	5,670	5,715	5,975	6,220	6,460	6,575	6,080	−1·1	−1·2
Western Europe	13,910	15,065	14,175	12,415	13,625	13,550	13,505	14,160	12,925	11,890	11,140	−2·2	−3·8
Middle East	2,165	2,170	2,330	2,075	2,300	2,240	2,535	2,365	2,445	2,205	2,245	−0·4	0
Africa	850	930	930	1,005	1,055	1,165	1,280	1,355	1,460	1,525	1,725	−7·3	−8·2
South Asia	540	590	550	485	550	605	645	675	705	795	840	−4·5	+6·8
South East Asia	1,385	1,705	1,560	1,545	1,865	2,030	2,330	2,450	2,370	2,480	2,335	−5·4	+2·8
Japan	3,745	4,430	4,300	4,055	4,230	4,285	4,240	4,340	4,015	3,630	3,360	−1·1	−4·7
Australasia	575	620	625	635	655	680	690	700	640	655	655	−1·3	−0·7
USSR, E. Europe and China	8,555	9,365	10,185	11,025	11,575	11,930	12,875	13,230	13,320	13,420	13,575	+4·7	+2·6
World	50,540	55,075	54,590	52,930	56,670	58,630	60,675	61,920	59,945	57,590	55,445	−0·9	−1·1
Trade imports						Thousand barrels daily							
US	4,740	6,255	6,125	6,025	7,290	8,710	8,225	8,410	6,735	5,950	5,040	−0·6	−10·4
Western Europe	14,065	15,405	14,840	12,610	13,725	13,295	13,090	13,080	11,825	10,245	9,350	−4·0	−6·8
Japan	4,815	5,480	5,430	4,945	5,320	5,510	5,335	5,605	4,985	4,460	4,155	−1·5	−5·5
Rest of world	6,585	6,890	6,935	6,755	7,965	7,240	7,400	8,255	8,390	8,000	7,020	−0·6	−0·6
World	30,205	34,030	33,330	30,335	34,300	34,755	34,050	35,350	31,935	28,655	25,565	−1·7	−6·0
Exports						Thousand barrels daily							
US	225	230	220	210	220	250	365	485	555	605	815	+13·7	+26·7
Canada	1,120	1,340	1,045	800	600	540	445	455	445	455	485	−8·0	−2·1
Latin America	3,630	3,885	3,490	3,175	3,310	3,115	3,400	3,645	3,885	4,380	4,135	−1·3	+5·8
Middle East	16,945	19,990	20,050	18,505	20,855	20,730	19,730	20,435	17,510	14,605	11,660	−3·7	−10·9
North Africa	3,480	3,400	2,625	2,405	3,070	3,295	3,370	3,425	2,820	2,175	2,145	−4·7	−8·2
West Africa	1,935	2,010	2,545	1,975	2,230	2,370	2,115	2,645	2,475	1,730	1,500	−2·5	−8·7
South East Asia	1,125	1,370	1,400	1,455	1,765	1,915	1,790	1,915	1,705	1,660	1,480	+2·8	−5·0
USSR, E.Europe and China	1,300	1,370	1,400	1,470	1,815	1,975	2,200	1,740	2,005	2,195	2,245	+5·6	+2·6
Other eastern hemisphere	445	435	555	340	435	565	635	605	535	850	1,100	+9·5	+14·3
World	30,205	34,030	33,330	30,335	34,300	34,755	34,050	35,350	31,935	28,655	25,565	−1·7	−6·0

Percentages are based on volume.
Ø less than + or −0·05%
Source: *BP Statistical Review of World Energy 1982*

Companies dealing with each other generally request bank letters of credit (LCs) to cover payment for a cargo from a buyer, unless the company is a "major" oil company, or is known to be creditworthy for the large amount involved. Only majors can consistently avoid opening credits, and even they have to do so for crude from certain national oil companies in the exporting countries.

Since trading companies frequently do not need to rely on substantial fixed assets, they may be based offshore and have relatively low capitalizations. Banks and trading customers see little corporate substance for security in dealing. Customers therefore depend on rigid security procedures involving banks for the handing over of goods and title; the banks similarly retain recourse to the goods and to the self-liquidating quality of the transaction as the principal source of collateral and security.

Thus traders need bank letters of credit or standby letters of credit to be opened to suppliers. The credit line of a trading company handling several cargoes at a time could be well over US $100 million, in the form of letters of credit and advances for secured trading transactions. Because there are few of the guarantees, controlled gearing and conservative financial criteria found in conventional banking transactions, banks have had to set up a strict *modus operandi* which provides them with the security of the goods and the assignment of their sales proceeds.

2. Transactional finance

2.1 Types of transaction and elements of risk

For a single cargo deals may be transacted several times over, through the operation of the spot market, from the time the cargo is put on the market to the moment of final delivery to the distributor or consumer.

2.1.1 Purchase FOB, Sale FOB

The trader's responsibility to his supplier is to nominate an acceptable vessel and to take delivery. As he has also sold on FOB (free on board) basis this responsibility is passed on to his purchaser.

2.1.2 Purchase C&F/CIF, Sale C&F/CIF

The goods risk is passed on to a cost and freight (C&F) or cost insurance and freight (CIF) buyer at the time of loading onto an accepted vessel. Since the purchaser has not chartered the vessel he does not have physical control of the goods until discharge, although he may have legal title to them (having paid the suppliers against presentation of bills of lading).

The transactions outlined in 2.1.1 and 2.1.2 are "strictly back-to-back" in commercial and shipment terms. Depending on the exact payment terms, they might not be considered so by a bank.

The commercial risks associated with such transactions are summarized below. Allowance must be made for the difference in shipping terms, since neither directly involves chartering of a vessel by the trader.

a. **Non-payment by the purchaser.** The credit risk purchaser is one of the principal concerns of a bank agreeing to finance a transaction. Except in the case of majors or their recognized subsidiaries, a bank letter or guarantee would be required.

A purchaser may refuse payment for a number of reasons, justified (due to non-fulfilment of contract terms for delivery, quantity, quality etc.) or unjustified. In either case, if an LC is given by the buyer, the trader's risk is limited to the production of the documents in strict conformity with LC terms representing the due shipment of goods. If the buying and selling contracts and LCs match, no shortfall or claims should result. Only when the sale is on open credit terms (i.e. no LC) could a payment by the buyer effectively be withheld, regardless of documentation produced.

The opening of an acceptable letter of credit by a purchaser does not, as may sometimes be assumed, necessarily imply that a vessel will be presented by that purchaser in due time. LCs usually only commit to payment upon shipment; if shipment engagements under the contract are not met, the LC may be useless if it runs out of time and certainly would not cover the potential costs of obtaining alternative freight.

b. **Non-performance or defective performance by supplier.** Non-delivery involves the risk of obtaining an alternative source to comply with the timing and price of onward sales commitments; it therefore includes both the price element, which can be considerable, and potential shipping claims. Late delivery would involve the risk of demurrage claims or potential refusal of vessel by the buyer. Defective delivery entails a risk that quantity or quality defects could result in the onward buyer refusing or curtailing payment to the trader. The trader should therefore protect himself by ensuring that his own payment is equally conditional.

c. **Shipping risks.** In case of non-presentation or late presentation of a vessel by the purchaser, the trader would have to enter the freight market at short notice under adverse conditions to take delivery from the supplier. Although indirectly a credit risk on the buyer (who would be fully liable for the consequences) this shows the importance of careful selection of trading counterparts, regardless of whether they have bank credit available to them. In case of late delivery of goods to the agreed vessel, demurrage at the loading port would of course be passed on from the charterer to the ultimate FOB seller, but would be the liability of the charterer in the first instance. From the point of view of the CIF purchaser, the risk passes to him from the FOB seller at the time of loading.

d. **Claims after discharge.** The purchaser may claim that despite documents presented at load port, the cargo supplied by the trader was "off-spec." on arrival. If this was not claimable from the shipowner

Exhibit 12.5. (contd)

Crude oil		Houston Yield	Houston Frt	Houston N. back	Singapore Yield	Singapore Frt	Singapore N·back	Rotterdam Yield	Rotterdam Frt	Rotterdam N back
Bonny LT 30·00	cr	32·11	0·76	31·35				31·04	0·83	30·21
	top	29·59	0·76	28·83				29·14	0·33	28·31
Brent 30·00	cr	31·53	0·74	30·79				30·64	0·25	30·39
	top	28·74	0·74	28·00				28·49	0·25	28·24
Minas 29·53	cr	31·11	2·19	28·91	31·47	0·12	31·34			
	top	26·88	2·19	24·69	27·81	0·12	27·69			
Attaka 30·95	cr	31·62	2·09	29·54	31·71	0·25	31·45			
	top	28·45	2·09	26·37	28·54	0·25	28·29			
Tapis 31·50	cr	31·96	2·06	29·90	32·16	0·19	31·97			
	top	29·79	2·06	27·73	30·28	0·19	30·10			
Cinta 28·25		30·22	2·16	28·06	30·70	0·16	30·53			
		28·27	2·16	26·11	29·32	0·16	29·16			
		31·59	2·16	29·43	31·59	0·16	31·43			
Daqing 28·70		30·15	2·60	27·55	30·65	0·75	29·89			
		26·42	2·60	23·82	27·41	0·75	26·66			
		31·38	2·60	28·78	31·41	0·75	30·65			
Alaska North Slope 27·00		29·76								
		26·92								
		30·72								
West Texas sour 28·00		30·74	0·47	30·27						
		28·07	0·47	27·60						
		32·27	0·47	31·80						
West Texas intermediate 30·00		31·90	0·47	31·43						
		29·83	0·47	29·36						
		32·57	0·47	32·10						

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Exhibit 12.6. Approximate cargo values, refined product cargoes

	Approx. recent prices (during May 1983) per metric ton (MT) FOB Med (cf. Platts oilgram)	Some usually traded cargo sizes—products 15,000 MT	20,000 MT	50,000 MT
a. Fuel oil 3·5%	$160	US$2.400.000	US$3.200.000	US$8.000.000
b. Gasoil	$230	US$3.450.000	US$4.600.000	US$11.500.000
c. Naphtha	$265	US$3.975.000	US$5.300.000	US$13.250.000
d. Premium gasoline	$295	US$4.425.000	US$5.900.000	US$14.750.000

Exhibit 12.7. Approximate cargo values, crude oil cargoes

	Official quoted prices per barrel (bbl) FOB 31st May 1983 (cf. Platts crude wire)	Some usually traded cargo sizes—crude 350,000 bbl (c. 50,000 MT)	500,000 bbl (c. 70,000 MT)	1,000,000 bbl (c. 140,000 MT)	1,500,000 bbl (c. 210,000 MT)
a. Belayim Arab Heavy	$26	$9.100.000	$13.000.000	$26.000.000	$39.000.000
b. Alaskan North Slope	$27	$9.450.000	$13.500.000	$27.500.000	$40.500.000
c. Iranian Light	$28	$9.800.000	$14.000.000	$28.000.000	$42.000.000
d. Arab Light	$29	$10.150.000	$14.500.000	$29.000.000	$43.500.000
e. Bonny Light, Brent	$30	$10.500.000	$15 000.000	$30.000.000	$45.000.000

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a negotiable and transferable document of title for maritime transport. Bills of lading are generally issued in sets of three, any one of which represents title to the goods. They are usually made out to the order of a particular party (the trader, the bank or the receiver of the goods) and can be blank endorsed.

When bills of lading are not available because of delay (usually in country of origin), letters of indemnity have to be issued instead by the party claiming title. An LOI has to be given by a first class company or by a bank (or has to be countersigned by a bank) to provide satisfactory protection for the buyer from potential third party claims.

Transfer of title may or may not coincide with the handing over of physical control of the goods. In some cases, legal title and physical control do not coincide. One such case is a CIF purchase when the cargo is still on the water, under the orders of the charterer, but the purchaser has had to pay documents at sight (i.e. cash against documents) or to accept documents tendered under a letter of credit (with or without LOI). The goods are paid for and the documents of title may be in the hands of the purchaser, but the seller, as charterer or disponent owner, exercises complete control of the vessel on the high seas. If he is able to avoid its arrest, he is effectively able to delay or divert it at his behest, even though he has received full payment.

Problems can arise out of bankruptcy proceedings or other disputes and can involve the legal owner in complicated wrangles with creditors, especially if goods are controlled or arrested.

The problem of ultimate control of the vessel—by a fraudulent shipowner in this instance—was highlighted by the Salem case. All the commercial parties to the transaction—Shell, the CIF purchaser and the charterer, a trader who had bought the cargo FOB from Kuwait—were duped by the owner, who conspired to steal the cargo and ordered it to discharge in Durban. He then scuttled the vessel off the West African coast and claimed insurance on the hull.

Security of goods implies adequate insurance. Banks always have this assigned to them, as beneficiaries of any claims, direct by the insurance broker involved.

2.2.2 Security of payment

A reliable payment instrument is always stipulated in the contract. When dealing with anything less than a recognized major company, this normally has to be an irrevocable letter of credit, standby letter of credit or guarantee issued by a prime bank some days before loading date.

To be an absolute guarantee of payment, LCs have to be issued by a first class bank and worded in a way that prevents the issuing party from attempting to withhold payment under that credit, without due cause. It is therefore crucial for the beneficiaries and their bankers to ensure that the LC opened in their favour is enforceable. This raises the question of discrepancies on documents. A purchaser and his bank have the right to withhold payment under an LC if the documents presented do not strictly comply with the LC terms. What constitutes a discrepancy, however, is subject to interpretation by the bank and by the purchaser, and it is sometimes claimed that banks could raise unjustified discrepancies in order to favour their clients and delay payment. In the oil business, where the amounts are so large, the bank's interpretation must necessarily be impartial. To this end, banks insist on totally clear wording to reinforce the rules of interpretation laid down in *Uniform Customs and Practice* (see Section 3.1.1).

The 12 or so largest and best known trading companies sometimes resist opening letters of credit to each other and to majors with which they are on particularly good terms. Reciprocated open account terms are keenly negotiated by traders between themselves, but are not always acceptable to the banks (in the absence of other guarantees). This depends on the amount of the deal and the overall financial strength of the party.

Various forms of bank guarantee other than LCs can enable sellers to secure due and prompt payment from buyers, but the LC is the most widely used guarantee in the oil business.

2.2.3 Price risks and contingencies

When financing long positions (cargo on the water or in storage or in process of being refined) the price risk incurred on the goods can only be covered by other guarantees supplied by the client. This is generally in the form of a cash margin, varying in accordance with the product and the state of the market.

Even when the goods have been sold to a satisfactory company and an acceptable credit opened, it is not always possible to be totally protected against quality, demurrage or other claims which would lead the buyer to pay less than the contractual price.

This is why only "strictly back-to-back" transactions—both commercially and in terms of payment conditions—can be considered solely upon their merits. Any other transactions (and even occasionally back-to-back ones, however strict) can generate contingencies and risks which effectively reduce the amount of the receivable or increase the cost of the goods, transport etc., so as to put the company and its banker in a deficit situation.

Such contingencies give rise to the need for the client to offer other guarantees to the bank, should the client's corporate resources not be substantial enough to cover potential shortfalls.

There is also the problem of offsets and counterclaims by the client's other buyers or sellers, in transactions other than the one financed by the bank. This is a substantial risk area for banks, and is dealt with in greater detail below.

Exhibit 12.8. Documentary letter of credit

This is an example of a documentary letter of credit, advised and confirmed by the beneficiary's bank (to be adapted on a case by case basis). This and the following sample texts are indicative only of the type of general wording used. The text in no way represents a standard form and should not be used or quoted outside this general context.

Attn: Documentary Credit Dept.

By order of.

We hereby open our irrevocable Documentary Letter of Credit No.

X X X X X X

In favour of:

For an amount of: USdlrs ..... +/− 5% (USdlrs .....

.....

Plus minus five percent)

Valid until December 10th, 1982 at your counters in New York and available for payment at sight against presentation of the following documents:

1) 2/3 original plus 4 N/N copies clean on board Bills of Lading issued to order of "....." and blank endorsed by same, showing—"Freight as agreed in charter party" and destination "....."
   —The quantity loaded should read in metric tons
   —C/P Bills of Lading acceptable.
2) Masters receipt of the 1/3 original Bill of Lading and copies of remaining shipping documents (except Commercial Invoice)—one original plus 4 copies.
3) Certificate of Origin certifying the Saudi Arabian origin of the product—one original plus 4 copies.
4) Certificate of Quantity issued by independent inspector appointed by sellers to effect inspection at loadport—one original plus 4 copies.
5) Certificate of Quality issued by independent inspector at loadport—one original plus 4 copies.
6) Ullage Report—one original plus 4 copies
7) Time Sheet—one original plus 4 copies.
8) Masters Receipt of Samples—one original plus 4 copies.
9) Commercial Invoice showing the C and F value of the loaded product and issued in the name of "....."—one original plus 4 copies.

Covering: ..... metric tons plus/minus five percent of .....

Price: USdlrs ..... (.....) per metric ton C and F .....

Shipment: To be effected in one lot ex Jeddah- Saudi Arabia between November 1–10, 1982.
To destination .....
Partial shipments/transhipments prohibited.

Special Conditions:

A. All banking commissions and charges outside of Switzerland are for beneficiaries' account.
B. Documents presented later than 21 days from Bill of Lading date, but [within] the validity of this L/C acceptable.
C. In all shipping the product must be mentioned and described as .....
D. If documents are not available when payment is due, then payment can be effected against presentation of the following documents:
   1. Commercial Invoice—1 original and 4 copies
   2. Seller's Bank Letter of Indemnity.

Please advise beneficiaries adding your confirmation

Upon receipt by us in ..... of your duly authenticated telex certifying having negotiated and sent to us by registered mail documents issued in strict conformity with the terms and conditions of this Letter of Credit, we shall cable cover you as per your instructions.

This letter of credit is subject to the I.C.C. Broch 290–1974 Rev and as per its Art. 4 (C) this telex represents the original credit instrument. No written confirmation will follow.

See Exhibits 12.10 and 12.11 for examples of Letters of Indemnity

documents are not presented and negotiated at the bank's counters, but are sent independently direct from the seller to the buyer or his bank. They are paid solely at the buyer's discretion, not—as with a normal credit—in accordance with the bank's commitment to pay against certain documents, since the bank would only intervene (secondarily) in the event of default.

The standby LC provides the seller with a bank guarantee to guard against default by the buyer. The seller will be able to obtain payment in the last resort under the standby letter of credit by submitting proof that he has shipped the goods to the buyer, his fully authenticated claim that he has not received due payment for the goods in accordance with the contractual terms, and his statement (countersigned if necessary by a bank) that the shipping documents had been remitted to the buyer or his bank.

The advantage of standbys is the saving in time and banking costs by avoiding processing by a bank, since under normal circumstances a standby credit, as its name implies, is never negotiated. Depending on the precise wording used, the bank may indeed be denied any control of or recourse to the shipping documents, and therefore standbys are not always acceptable if rigorous security of the goods is essential. Such security can be given by restricting the standby to claims which provide satisfactory confirmation of the whereabouts and content of the documents. The standby may also have certain advantages in relation to banking regulations in some countries.

Exhibit 12.10. Letter of indemnity: Example 1

We, ..., refer to a cargo of ..... MT ..... oil shipped on board the tanker M T..... at the port of ..... pursuant to original Bills of Lading dated .....

Although we have sold and transferred title of said cargo to you, we have been unable to provide you with the original Bills of Lading and shipping documents as required under ..... L/C No .....

In consideration of your paying the full purchase price of US dollars ....., we hereby expressly warrant that we have the full right and authority to transfer such title and effect delivery of the said oil to you.

We further agree to exercise our utmost efforts to locate and surrender to you as soon as possible the original Bills of Lading and shipping documents and save you harmless from and against all damages, costs, counsel fees, and any other expenses that you may suffer by reason of the original Bills of Lading and shipping documents remaining outstanding, including but not limited to, any claims and demands which may be made by a consignor, holder or transferee of the original Bills of Lading and shipping documents or by any other third party claiming interest in or lien on the cargo or proceeds thereof.

This Letter of Indemnity shall automatically be null and void at the moment original Bills of Lading and shipping documents in strict conformity with ..... L C No ..... are tendered to you.

Authorized signatory of Company

.....

We join in the above Letter of Indemnity

..... Bank

Authorized Signatory

.....

The shipowners and their representatives have drawn up specific wordings for banks to cover these indemnities. These wordings often include an amount and a period of validity outside the terms of the commercial transaction as financed by the bank. It is therefore more difficult for a bank to cover itself entirely for the liability entered into in shipping LOIs, and it will have to look to its client and to the parties in the transaction to counter-indemnify it. To avoid this problem some owners wish to keep one of the bills of lading on board the vessel, although this in itself is never a complete protection and may lead to other complications.

A disadvantage of LOIs for banks is that they tend to create rapid accumulation of outstandings on customers using them. This effectively doubles up the total bank commitment in any back-to-back transaction, and adds considerably to the amount of the bank's declared contingent liabilities.

Exhibit 12.11. Letter of indemnity: Example 2

Re. MT .....

We understand our client ..... of ..... is issuing to you the following indemnity.

QUOTE

In consideration of your delivering to us or our order the goods in the above steamer marked .... MTS ..... shipped by Messrs ..... and consigned to us the Bills of Lading for which have not yet arrived

We hereby undertake to hold you and each of you harmless and keep you and each of you indemnified against all claims which may be made upon you and each of you or any of you under said Bills of Lading or anyone of the set which it forms part, and against all loss, costs (as between attorney or solicitor and client), damages and expenses which you or any of you may suffer or be put to by any reason of the delivery of the said goods to us, any claims that may be put forward due to the fact that the cargo was delivered in another port than stated in the Bills of Lading and if any proceeding be commenced with respect to the said goods, from time to time provide you with sufficient funds to defend the same and if called upon to do so at any time whilst the goods are in our hands to redeliver the same to you. The undersigned consignees undertake to produce the Bills of Lading for the above goods duly endorsed as soon as these documents have arrived. In the event any demand is made for indemnification, for the furnishing of funds or for the delivery of the goods, the same shall be complied with forthwith without the assertion of any counter claim, set off, recoupment or right to retain whatsoever. In case the vessel or any property belonging to you should be arrested for any claim in connection with the delivery of the goods in question to us, we undertake to provide bail to get the vessel or other arrested property released and to indemnify you for any loss and expenses caused you by arrest whether same is justified or not.

UNQUOTE

We, ..., hereby join in the above letter of indemnity on the same terms and conditions. However it must be noted that our liability in this matter is limited to ..... and is valid for a period of ..... months and is subject to English law and shall be construed in accordance with the jurisdiction of the High Court of Justice in England.

3.2 Collateral requirements

Bank commitments issued in connection with specific trading transactions can be more or less fully secured on the basis of commitments from other parties or banks involved in those transactions. This constitutes the self-liquidating nature of the operation, and can take a number of forms.

refined product at the time of the opening of the LC for the purchase of the crude oil. For the bank therefore, the situation is that of a long position which needs to be secured. In both banking and commercial terms the financing of a processing deal is considerably more complicated than the financing of stock in tank. The basic requirements are:

a. Considerable cash margin (about 25% as in a long position) to cover the price risk on the unsold products over time.
b. A "third party custodian" agreement between the refinery and the bank whereby the refinery undertakes to hold at the bank's disposal specific quantities of product corresponding to the yields for the particular crude cargo; and that no quantity of product can be released from the refinery without the prior written approval of the bank
c. The bank would obviously have to be fully satisfied with the financial position of the refinery.
d. Adequate sales strategy

There are certain cases when the customer's client is the refinery itself, needing to purchase crude to run it for its own account. At times recently refining has not been very profitable; such deals are notoriously complicated to secure, generally requiring substantial supplementary guarantees outside of the specific processing deal to give full protection to the bank.

There are various solutions to this problem. Not all of them require direct bank finance, since a supplier can at his own risk supply direct to the refinery and retain a lien on the crude/refined product inside the refinery, receiving payment for it only at the time that the refinery has actually sold the product. This can help solve the considerable cash flow problems suffered by independent refiners in a difficult market.

3.2.5 Hedging

Futures contracts in gasoil are now traded on the International Petroleum Exchange in London (100 tonnes contract) and the New York Mercantile Exchange (42,000 gallons number 2 heating oil). The latter also has contracts for leaded and non-leaded regular gasoline, ex-New York harbour.

The volumes traded on these markets permit traders to hedge very substantial volumes at one time. A cargo of 20,000 tonnes of gasoil is the equivalent of 200 lots in London and 150 lots in New York, and such volume is traded several times over in a day.

Utilization of these markets has grown very quickly since they were opened. Interest was at first restricted to certain consumers and speculators, but traders are now showing considerable interest as well.

The creation of a crude oil contract, planned to open on the Chicago Board of Trade in 1983 and on MYMEX in New York, and soon in the UK on the IPE, adds considerably to the possibilities for hedging and arbitrage. Some see a crude futures market as a possible threat to stability through the influence of speculators; others emphasize hedging's stabilizing effects.

The influence of the physical price on the futures price, and *vice versa*, is a major factor for trading decisions. Hedging through the futures market has already become an important new element for oil traders, who now have to differentiate functionally between the physical and futures market, as happens in other commodity fields. This will affect the way in which banks secure long positions, provided that the broking and operational rules permit some control from the bank's side.

3.2.6 Barter deals

Oil producing countries can use their crude oil instead of foreign currency to pay for imports. Iran and Libya, among others, have provided considerable opportunities for oil barter in recent times, although as a general rule the national oil companies prefer to be paid in dollars for their crude. Oil barters can be notoriously complicated since they involve close coordination between different ministries in the crude exporting country and between various commercial counterparts handling the transactions outside.

Another complicating factor is the fact that barter deals generally involve the pricing of crude oil at the official OPEC price, which may be substantially higher than the spot market price. The oil side of the transaction therefore frequently involves a large loss in nominal terms to the company trading it; this loss has to be compensated for by a profit on the commodity.

Banks play an important role in setting up escrow account procedures and coordinating transactions so that security at all stages is ensured. In hypothetical terms the following stages would be followed:

a. Establishment of some form of bilateral transaction agreement between the importing ministry, the national oil company, the national bank, the foreign contractors' counterparts and a bank outside the country which would have to provide the escrow account facilities
b. Delivery of the crude to an oil trader FOB, payment being made by letter of credit into the escrow account
c. Delivery of the commodity to the importing country, payment to be made by letter of credit opened by the national bank, confirmed to the seller of the commodity by the bank holding in escrow the proceeds of the oil transaction. Simultaneously the trade financing bank would have had to secure the onward sale of the crude to an acceptable company and to open a letter of credit to the supplier of the commodity.

In summary, timing is essential to the security of the transaction and to ensure that the importing country has sufficient dollars paid into the escrow account to cover both the full amount of the exported commodity and the losses often generated on the officially priced crude.

All instructions, assignments, copies of contracts etc. are communicated between companies and their banks in the form of telexes which do not always allow proper authentification procedures when third parties other than the client are involved. The administrative work to follow up and check written confirmations takes a considerable time and is usually effected *ex post facto*.

Documentary procedures inevitably carry the possibility of delay or loss of documents and therefore the need for letters of indemnity to cover missing documents. Furthermore, documents of title (which rapidly become "stale") are no comfort in the case of legal arrest of or contentious claims over the goods. Maturity of LCs and LOIs as regards date of presentation of a claim and the payment of that claim must be closely monitored and modified if necessary in good time, before physical delays occur.

Indemnities for payment of LCs in the case of non-conforming documents, and the payment "under reserve" of LCs are frequent. The bank's security position in these cases is affected and can only be protected if the proper commercial procedures and control of the goods allow the necessary monitoring.

Documentary LCs sometimes permit unjustified recourse to infinitesimal documentary deficiencies by clients unwilling to pay. To avoid such problems, it is necessary to use prime banks accustomed to the oil trading business, to use unambiguous wordings, and to ensure adequate control of the goods in any contentious commercial situation.

4.1.3 Flexibility in application of security procedures

Most transactions by regular traders are not strictly back-to-back, since this would unduly hamper flexibility and speed of action in business. Banks have to live with this problem, relying on the commercial expertise and appropriate back-up of the trader. The trading company itself, outside the control of the bank, will have to solve the inadequacies and fill the gaps in documentation in most instances, without necessarily relying entirely on the wording of a payment instrument.

Despite pressure by banks to structure operations in a strict back-to-back manner, reputable clients would have considerable freedom in bending the rules and operating outside the desirable documentary parameters. Competition from other banks attempting to enter the business might also induce bankers to relax the rules, in an attempt to preserve or attract business. The disadvantages of this to the banks are obvious.

Time and time again—especially recently—the dramatic fluctuation of prices in the oil market has caused equally dramatic and sometimes quite surprising defaults on behalf of what had previously been excellent and scrupulous companies. It is only by observing relatively rigorous and inflexible disciplines in the structuring of their transactions that banks can ensure the protection of their collateral and avoid problems with their clients in times of stress on the markets.

Banks are not alone in being tempted to relax the rules when business is good; many companies operating on an open account basis amongst themselves have found that in difficult times, they became unsecured creditors of a company on the brink of collapse, being offered highly unsatisfactory settlement terms by their former excellent trading counterparts. It is to avoid such unpleasant surprises that rigidity and application of the basic rules of security in oil trading should be observed at all times.

4.1.4 Legal questions

A detailed consideration of the legal aspects of spot market trade disputes involving arrests and claims by third parties is not possible here. It is sufficient to mention some of the elements which should be reviewed in detail by a bank when a client's position deteriorates either overall or in a specific transaction.

a. The bank's secured interest and prior claims upon the goods and receivable should be indisputable. This is never quite so simple since bankruptcies and third party claims in a large trading position can materially affect the bank's security position.
b. Jurisdictional barriers to the enforcement of the bank's legal claims should be minimized. Since the majority of trading companies are offshore entities, a proper system of cross collateralization should be determined at the outset.
c. Speed of action in securing claims legally is paramount. The need to know quickly how and where to act by legal means is an essential part of the credit officer's job in monitoring the activities of customers.

These questions are complex and the bank's position has to be evaluated separately for each customer. The principal technical problem however, revolves around the possibility of arrest or counterclaim. Even if a bank is in possession of a major's purchase confirmation and payment undertaking, it is possible that the legal entanglements can facilitate the arrest of goods, or the blocking of funds on an account, even after satisfactory negotiation of a letter of credit.

4.2 Credit limits and risk management

Unlike most trading companies, banks have to work within the strict defined limits imposed on them by their shareholders and regulatory authorities, concerning both the total possible outstandings on any particular customer, and the maximum exposure desirable in any particular commercial sector or geographical area.

For banks financing the oil trade such limitations pose particular problems, because the amounts in-

4.3.3 Trading companies

However big a trading company, the rapidly fluctuating nature of trading makes balance sheet appraisal subject to certain difficulties. In addition, the usual complexity of the corporate structure of a trading group makes consolidation problematic. This means that the figures given by trading companies for their activities, though indispensable as a guideline, infrequently provide the kind of comfort required for such substantial lines of credit. Ultimately, therefore, the total amount of credit which a bank can make available to a customer would depend on other factors, primarily the banker's confidence with regard to the customer's commercial morality and openness with his bankers; the customer's trading ability, as judged from his track record; his operational skills and trading infrastructure; and the extent to which the bank's documentary credit department and its officers have a good and intimate relationship with the operations staff of the customer. (It is on the operations side that risks are controlled and that problems, when they arise, can be solved.)

In dealing with a trading company, experience is one of the crucial elements in determining the degree of professionalism and solid trading know-how of its executives, traders and operational staff. This quality of professionalism is ultimately the banker's best guide to what sort of credit can be made available.

The banker's approach is gradual since it takes time to understand a company's workings. In the initial stages a bank generally shows considerable resistance, since it is scrutinizing every element of a deal and attempting to mould the deal according to its security requirements. This is in the client's best interest, since he may have less knowledge and experience of financial and payment problems than he has of trading *per se*.

The real test of a banker's expertise is therefore in the early days of a trading company's life, when it has to establish a reputation for itself in the international market and needs a banker to provide the abundant credit and good references required of any newcomer.

In deciding ultimately how much and what sort of credit a trader deserves, the banker will be relying on his intimate knowledge of the trade and the people involved; this gives him an intuition as to what is bankable and what is not.

5. Conclusion: Specialized banking

Few banks play a significant role in the financing of the international oil trade. They are generally of Dutch, Swiss, French or American origin and are based in the main trading centres—Rotterdam, London, Geneva, New York, Houston and Singapore.

To service the needs of their trading clientele, and therefore also the requirements of these companies' customers, banks have to provide a full range of banking services worldwide. These services must be undertaken with a speed of decision, versatility and lack of bureaucracy not always associated with large international commercial banks. This results in a highly specialized service, which includes 24-hour personalized banking and an in-depth knowledge and understanding of the trade.

The role of the banks extends far beyond the simple provision of letters of credit and the taking of risks which this implies. The oil trading community worldwide—national companies, majors and independents included—needs banks to facilitate communication and exchange of information between its constituent members. Banks do not always find it easy to discharge this complex brief, but they hope, by maintaining and developing a constant dialogue with all sides of the industry, to perform a useful role in relating the methods and resources of institutional finance to the commercial needs of the international oil market.

Section 13

Oil Brokering

A. DEFINITION OF A BROKER

An "agent" of "middleman" who earns a commission for arranging a deal between two principals. The broker has no financial interest or ownership in the commodity that is being bought or sold. Although usually paid for his services by the seller, he is strictly neutral in his services.

WHY USE A BROKER

Oil companies and traders use the services of a good broker for a number of reasons.

Firstly, if he is good, he can be relied upon to have up-to-the-minute market information which he has gleaned from a fairly wide circle of refiners and traders to whom be regularly talks. A trader is not always able to spend sufficient time himself to cover the whole market. Any number of topics might have a prior claim on his attention: eg. management or strategy meetings, a refinery programming meeting, credit matters, legal arguments, operational matters. A broker has none of these pressures, and can give 100% of his time - every day - to securing the market information that the trader does not have time to do himself.

Secondly, a trader may have a specific trading position which he might want to shelter from the "rude and vulgar" gaze of the trading world. He would therefore use the broker to front for him - to explore, through his contacts, the possibilities that might be available for him to cover or sell his cargo.

Thirdly, the trader may wish to determine the trend in the market, or, as in some well known instances, influence the trend in the market, by offering to buy or sell, when he has no real intention of doing it. Sometimes this is done to determine the competition, sometimes to throw the market off the scent of his real position. A broker is an ideal vehicle to sow such disinformation. However, and I will expand on this later, there are some dangers which can adversely affect a broker's credibility.

Fourthly, a trader may seek some independent advice, and will use a broker - one he knows he can trust - to test out some ideas. Two heads are always better than one in developing a trading direction, and the principal may not always be in a position where he can talk to his immediate colleagues or superiors. A broker in this instance might be required to suggest a course of action, or come up with some ideas, or simply be asked what he would do in the same situation.

Fifthly, a company may use a broker because he needs an independent witness in a deal. In this somewhat imperfect world, I'm afraid to say, certain companies prefer to deal indirectly with each other rather than directly. The reason is usually to do with a dispute or misunderstanding in a previous deal.

These to my mind are the five main reasons why brokers are used. Some companies never use brokers; some use them all the time, and rarely talk to other principals; most companies use them some of the time. In all this, two things are vitally important to a broker's success:

a) He must know what is going on in the market - every day - every hour, every minute.
b) He must inspire confidence, and above all trust.

B. DOING THE DEAL

Putting a deal together can take as much as two weeks or as little as two minutes. Each client is different, each requires his deals done in a certain way, but what is fundamental is that a broker has to accurately and clearly transmit and reflect the needs of both parties. Often a broker will find that he has two parties, neither of whom are English, but who are conducting the negotiation in English, through him. The broker has to be extremely careful here to ensure that each side knows what the other wants, and often, if there is a language problem, to act as interpreter.

Some deals are very straightforward, such as a 15 day Brent crude sale, or a Russian gas oil sale, the terms of which are standard and well known to the numerous companies who trade in such paper markets. In such deals, apart from the names of the parties concerned, the only negotiation which takes place will be over the price - everything else practically is standard. Other deals clearly are much more complex, may take several days to get done, and the terms of which may change more than once before the deal is completed. It may require the inclusion of whole series of provisions which are additional to the standard ones, and which have to be hammered out bit by bit. In this case the major points, at this stage, are Platts/Fixed-Gravity and Volume. In these types of deals, a broker really earns his money; right through the negotiating period he must keep an accurate and complete record of what has been said and agreed, what has been changed and added. This is done on the same type of documentation that Meg used yesterday. His clarity will breed confidence, and more often than not will help to get the deal done. Particularly important in the transmittal process are the specifications (usually on products), the delivery period, the price basis, and the payment provision. A broker cannot afford to make a mistake in these crucial areas.

C. RELATIONSHIP/TRUST ETC.

As stated earlier, a broker's sole objective is to earn a commission by negotiating the sale/purchase of a cargo of oil between two principals. Also as stated earlier, his ability to do this will largely depend on the confidence the principals have in his knowledge and market information, and on the trust that he inspires. These "talents", if they can be so described, are of course interdependent. The greater the trust in the individual, the greater the information that individual will be entrusted with, and vice versa.

Now, no one broker is going to be able to retain all the confidence and trust of all the players in the market. Human nature being that it is, likes, dislikes and prejudices abound in this business, as in any other walk of life; a broker, therefore, will concentrate on the circle of companies he knows best, and thus it is natural that, where he has enjoyed a profitable and good relationship with a particular company, he will tend to put that company on top of the list of people to call when an interesting opportunity presents itself. Right from the start then, we have an inbuilt partiality. This, I believe, is not a problem providing the broker mixes his loyalty to the favored company with a degree of professionalism which should characterize all his dealings.

Where a company asks a broker to assess the potential for selling or buying a specific cargo, he may well request:

a) His name to be kept entirely confidential (until firm offer stage).

b) The broker speak only to specific companies (or to avoid speaking to others with whom he is already direct).

c) to avoid disclosing any information to the market which might expose the position (which might well be distressed).

A broker is often asked to go to work with these restrictions and "caveats", and he must protect his client all along. However, in order to attract the interest of a buyer/seller, a certain amount of information has to be divulged.

In many instances, because the market in both crude and products is now fairly transparent, the restrictions imposed on the broker may be pointless, because intelligent well-informed traders are quick to guess specifics. In this case there is no point in the broker denying it, but then he should inform his client of the response from the other parties.

In other cases a party may be interested in the availability/requirement of the client, and might wish to have information which the broker has been asked (temporarily) to withhold. Here, a broker has to exercise some powers of authority, in insisting on the confidentiality requested. I have usually found that if it is done in the right way, the other party will back down and respect these wishes. Again, if the other party also knows and trusts the broker, then these delicate moments in the early process of a negotiation can be fairly easily overcome.

The element of trust is never more important than at the moment of truth in a deal (i.e., when the deal is about to be consummated). It is at this point that all three parties in the deal (the two principals and the broker) are at their most excited. The adrenalin is flowing. Both sides are wondering if they've given away too much, or asked for too little, during the negotiation, whilst the broker can clearly see the commission cheque being typed out. I believe that it is at this point that a broker must be totally impartial and honest. There is a terrible temptation to force the issue with a wavering principal rather than see a deal go by default, and much work and effort go unrewarded. It is very easy to say "Joe, I would do this deal if I were you - I've got someone else who will do it if you don't."

Even if this were true, I believe it is a dangerous element to bring into the game. It puts undue pressure on the person who may be wavering. If the broker has done his job properly - imparted all the relevant information to each party, has relayed accurately all offers and counter offers, terms and conditions, it must ultimately be the decision of the principal to go ahead. I believe, to preserve his integrity and independence, the broker must at this stage stand back and say "the decision is now yours." To do otherwise - I believe - is to compromise one or other of the parties.

One of the broker's functions, as I said earlier, is to sow disinformation in the market in order to deliberately mislead the market or disguise a position. Clearly, a broker is a useful "tool" in this context, but if it has to be done, I would far rather do it unwittingly than be a party to the deception. The broker would naturally tend to feed the disinformation to those companies who he is least close to, rather than compromise his good relationship with others. If at all possible it is best to try to avoid these situations.

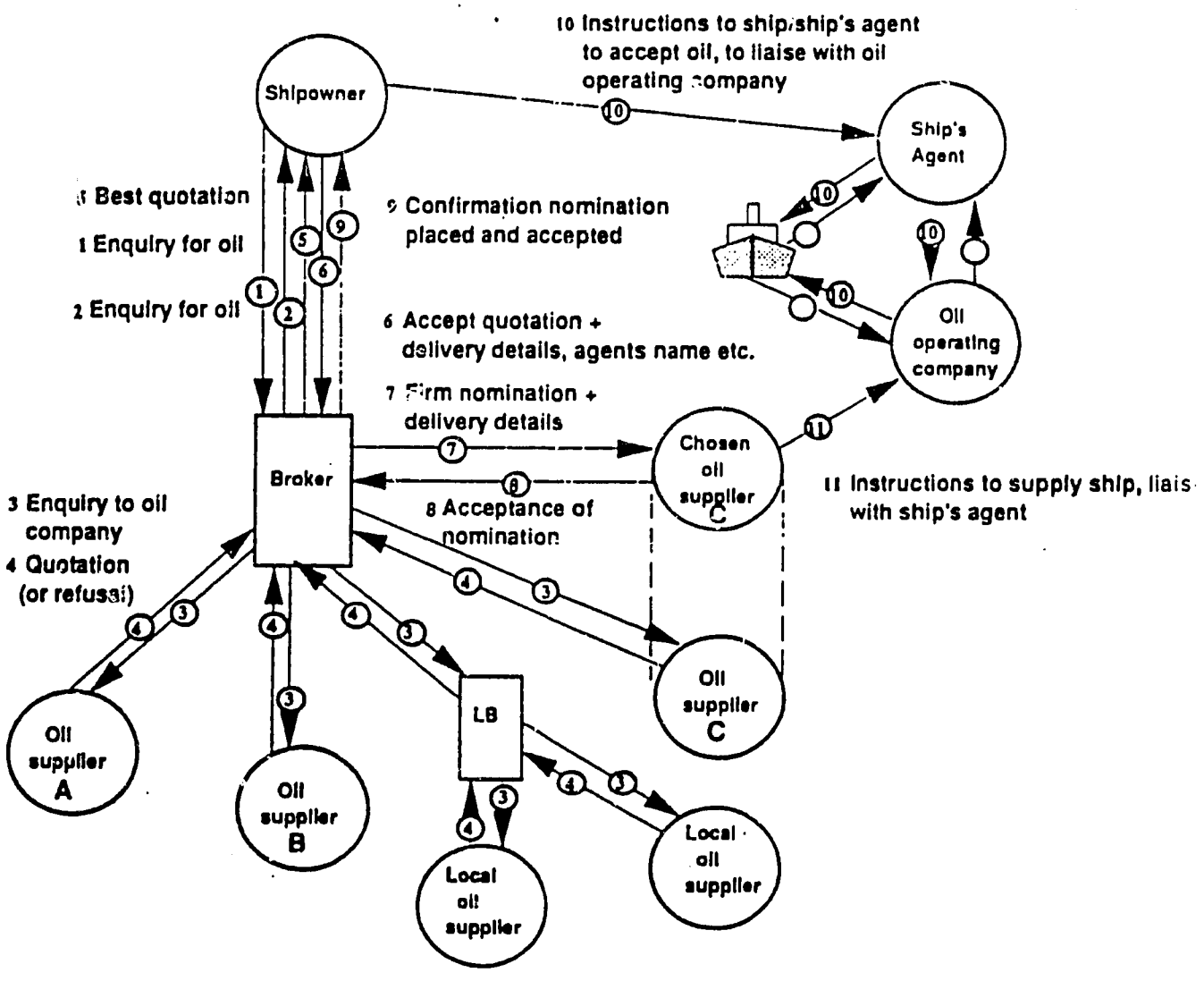
D. ADMINISTRATION AND OPERATIONS

After the conclusion of a deal, the broker will usually (although not always) administer the operations between the two parties, since they have an independent witness, should any

points in the contract subsequently be called into question. (Hence the importance of taking and keeping notes of each negotiation). The sequence of events leading up to the cargo delivery and payment should be closely monitored by the broker to ensure that no problems arise (i.e., remaining the party to nominate a vessel or open an L/C by a certain date). The administration of the operations has to be meticulous. It normally includes:

1) The confirmation telexes which are sent to both parties following the conclusion of a transaction on the phone must exactly reflect what both sides have understood during the negotiations.
2) He should press each party to fulfill the contract in good time passing on wordings of L/C in good time to meet an agreed opening date.
3) Telex confirmation should always be requested to back up verbal advice.
4) Nominations of vessels and loaded details of cargoes should be supplied in good time and disport nominations returned.
5) He should ensure that payments are made in time and if problems arise that both parties approach these through the correct channels rather than arbitrarily with-holding payment.
6) Demurrage claims must eventually be settled.
7) Commissions must be received.

THE ROLE OF THE BUNKER BROKER



Source: The International Marine Bunker Oil Market

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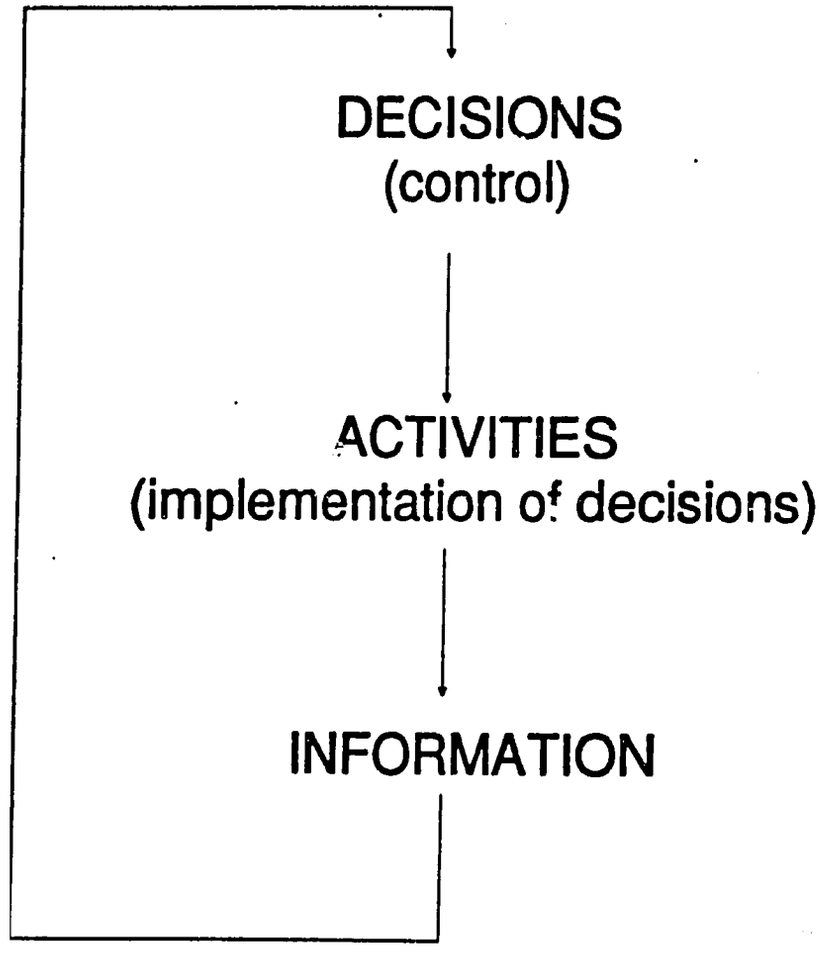
Section 14

Implementation Issues

DECISIONS, ACTIVITIES AND INFORMATION

State objectives and rules, then:



DECISIONS

- Choosing alternatives
- Managing risks

DECISIONS

Choosing alternatives:

- Volume
- Timing
- Quality
- Location
- Price
- Payment

DECISIONS: MANAGING RISKS

- Client/counterparty risk

  Making sure you are trading with the right people

- Operational risk

  Making sure that the correct oil arrives in the correct place at the correct time

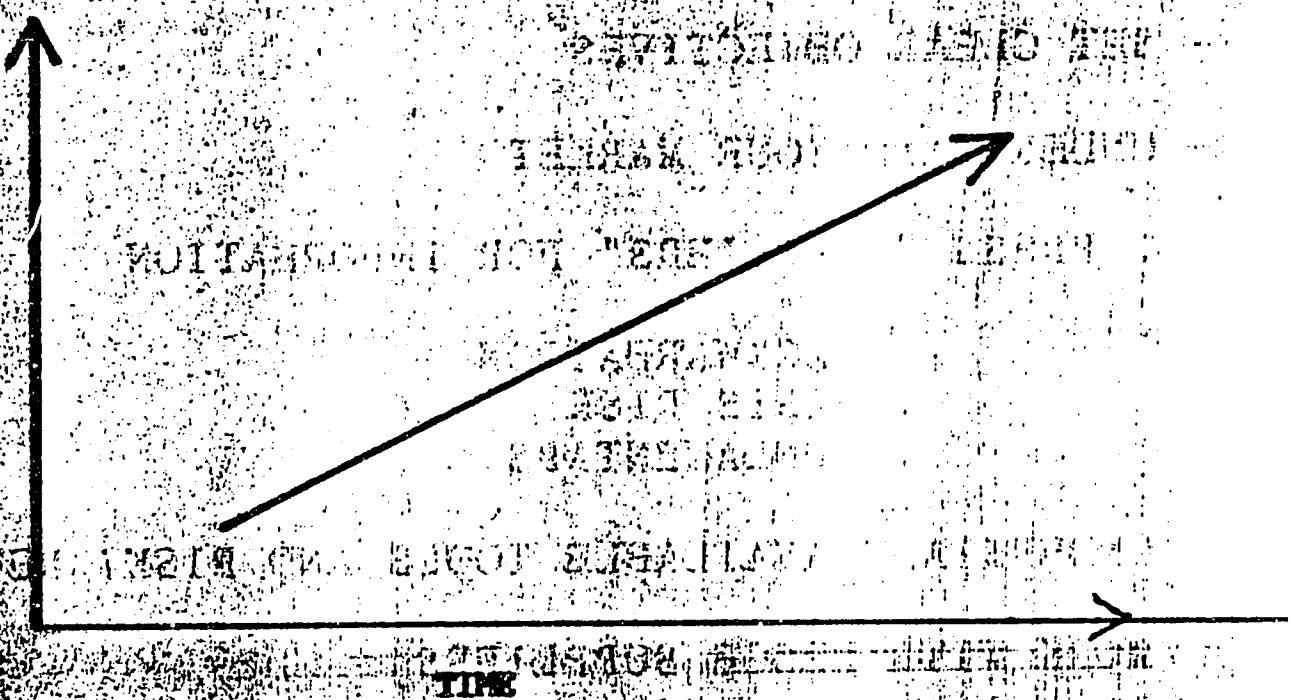
- Price risk

  Making sure that changes in the international prices of oil do not mean that you pay more for your oil than you expected / can afford

KEYS TO AVOIDING MISTAKES

- SET CLEAR OBJECTIVES
- UNDERSTAND YOUR MARKET
  - PRESS "SUPPLIERS" FOR INFORMATION
    - BACKWARDATION
    - BASIS RISK
    - FUNDAMENTALS
- UNDERSTAND AVAILABLE TOOLS AND RISK/ REWARDS
- WORK WITH HEDGE SUPPLIERS

BACKWARDATION



[illegible] PRICE RELATIONSHIP :

	$/BBL
[illegible] MONTH 1	20.00
[illegible] MONTH 2	19.50
[illegible] MONTH 3	19.00
[illegible] MONTH 4	18.50

IMPLEMENTATION
POLICIES AND PROCEDURES

ROLE OF MANAGEMENT:

- OBJECTIVES/CONSTRAINTS
- ACCOUNTABILITY
- ORGANIZATION
- MONITORING

ADMINISTRATION:

- CASH-OFFSET ACCOUNTING
- TREASURY (FOREIGN EXCHANGE, BROKERAGE, ETC.)
- LEGAL

IMPLEMENTATION:

- WRITTEN PROGRAM
- QUANTIFY PRICE RISKS AND GOALS
- DEFINED TRADING RULES
- RECORDED ACTIVITIES
- APPOINT HEDGE DIRECTOR

ROLE OF MANAGEMENT

WHAT IS THE ROLE OF THE OIL FIRM IN THE CONTEXT OF A PRIVATIZED ECONOMY?

ROLE EXPANDS FROM PURCHASING TO TRADING, SINCE PROFIT MOTIVE NOW IMPORTANT. BUT WHAT IS PROFIT TO THE OIL FIRM AND/OR TO THE ECONOMY?
WHOSE PROFIT?

REFINER
TRADER
MARKETER
BANKER
GOVERNMENT AGENCY

WHAT ARE THE OBJECTIVES OF A FUTURES TRADING OPERATION?

- EARN FUTURES PROFITS
- ENSURE CASH PROFITS
- EXPAND CASH TRADING
- FIX COSTS OF OIL TO ECONOMY
- CAP COSTS OF OIL TO ECONOMY

SPECIFIC GOALS

- TIME HORIZON
- QUANTITIES
- BUDGET CONSTRAINTS
- ADMINISTRATIVE COSTS
- PERFORMANCE STANDARDS
- REPORTING REQUIREMENTS

WHAT ORGANIZATION OF PEOPLE NEEDED?

- SHOULD CASH TRADERS MAKE FUTURES DECISIONS?
- SHOULD FUTURES TRADING BE SEPARATED FROM CASH?
- HOW MANY PEOPLE NEEDED?
- WHAT SKILLS REQUIRED?

IMPLEMENTING A HEDGING PROGRAM

A. DEFINE GOALS OF PROGRAM AND RISKS

B. MANDATE GOALS AND AUTHORITIES

C. DEFINE ORGANIZATION

D. DEFINE DUTIES AND DELEGATION OF AUTHORITIES

E. DEFINE TRADING SYSTEM

F. BROKER SELECTION

G. CONTROLS/OVERSIGHT

H. WRITTEN PROGRAM

I. IMPLEMENTATION PROCESS

J. FUTURES INSTRUMENTS AVAILABLE

A. DEFINE GOALS OF PROGRAM AND RISKS

- PURE HEDGING ACTIVITY (WITH IDENTIFIABLE CASH OFFSET AND LIMITED BASIS RISK)

- SELECTIVE HEDGING ALLOWING FOR LIMITED POSITION TAKING WHERE BASIS RISK MAY BE GREATER AND FUTURES USED IN PLACE OF CASH

- TRADING FOR PROFIT, BUT ONLY VIA LIMITED RISK SPREAD AND DISCRETIONARY TIMING STRATEGIES

  - ARBITRAGE
  - SPREADS
  - LIMITED SPECULATION

B. MANDATE GOALS AND AUTHORITY

- DECISION MADE BY TOP MANAGEMENT (BOARD)

  - GOALS FOR HEDGING PROGRAM

  - AUTHORITY LIMITS FOR DIRECTOR OF PROGRAM

- WRITTEN STATEMENT BY BOARD

- APPOINTMENT OF TRADING DIRECTOR/COMMITTEE

C. ORGANIZATION

- CENTRALIZED VS. DECENTRALIZED

- SHOULD CORRESPOND TO DEGREE OF PROFIT CENTER ACCOUNTABILITY

- ARE ANY OF THE FOLLOWING ACTIVITIES DISTINCT?
  - CRUDE PURCHASING
  - REFINING
  - SUPPLY AND DISTRIBUTION
  - MARKETING

- WILL INTERNATIONAL AND DOMESTIC ACTIVITIES BE SEPARATE?

- WILL IMPORT AND EXPORT ACTIVITIES BE SEPARATE?

I. IMPLEMENTATION PROCESS

A: STRATEGY

- BEFORE ENTERING INTO FUTURES/OPTIONS TRANSACTION, TRADING MANAGEMENT/TRADERS MUST DEVELOP STRATEGY TO MEET PROGRAM GOALS

B: PLANNING

- SHORT TERM PRICE FORECASTING
- SPECIFIC CRUDE OIL MARKET FORECASTING
- PRICING CASH CRUDES
- USE FUNDAMENTAL AND TECHNICAL ANALYSIS FOR FORECASTING

NOTE: NEED "FUTURES" PLANNING, FORECASTING, RESEARCH GROUP TO SUPPORT TRADERS AND TO INTEGRATE WITH CASH TRANSACTIONS.

IMPLEMENTATION PROCESS

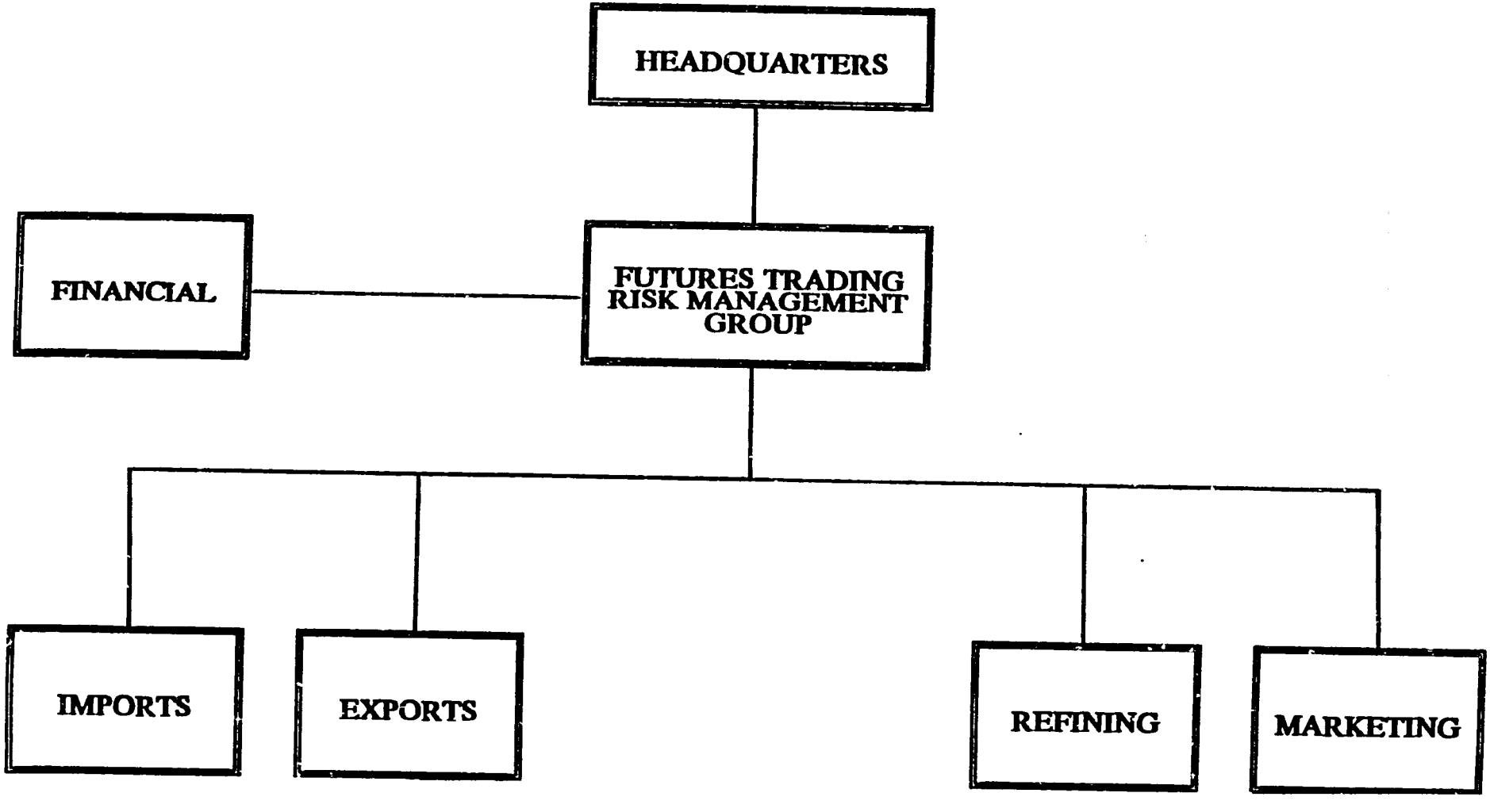
C. TRADING

- SELECT APPLICABLE SYSTEM/TOOLS
- DEVELOP TRADING PLAN
- TEST PLAN ON PAPER OR WITH LIMITED VOLUME
- FOLLOW SYSTEM MECHANISTICALLY
- ADJUST PERIODICALLY FOR CHANGES IN FUNDAMENTALS
- FINE-TUNE SYSTEM FOR COMPANY OR MARKET SPECIFIC VARIATIONS
- DOCUMENT PROCEDURES AND RESULTS FOR PERIODIC MANAGEMENT REVIEW

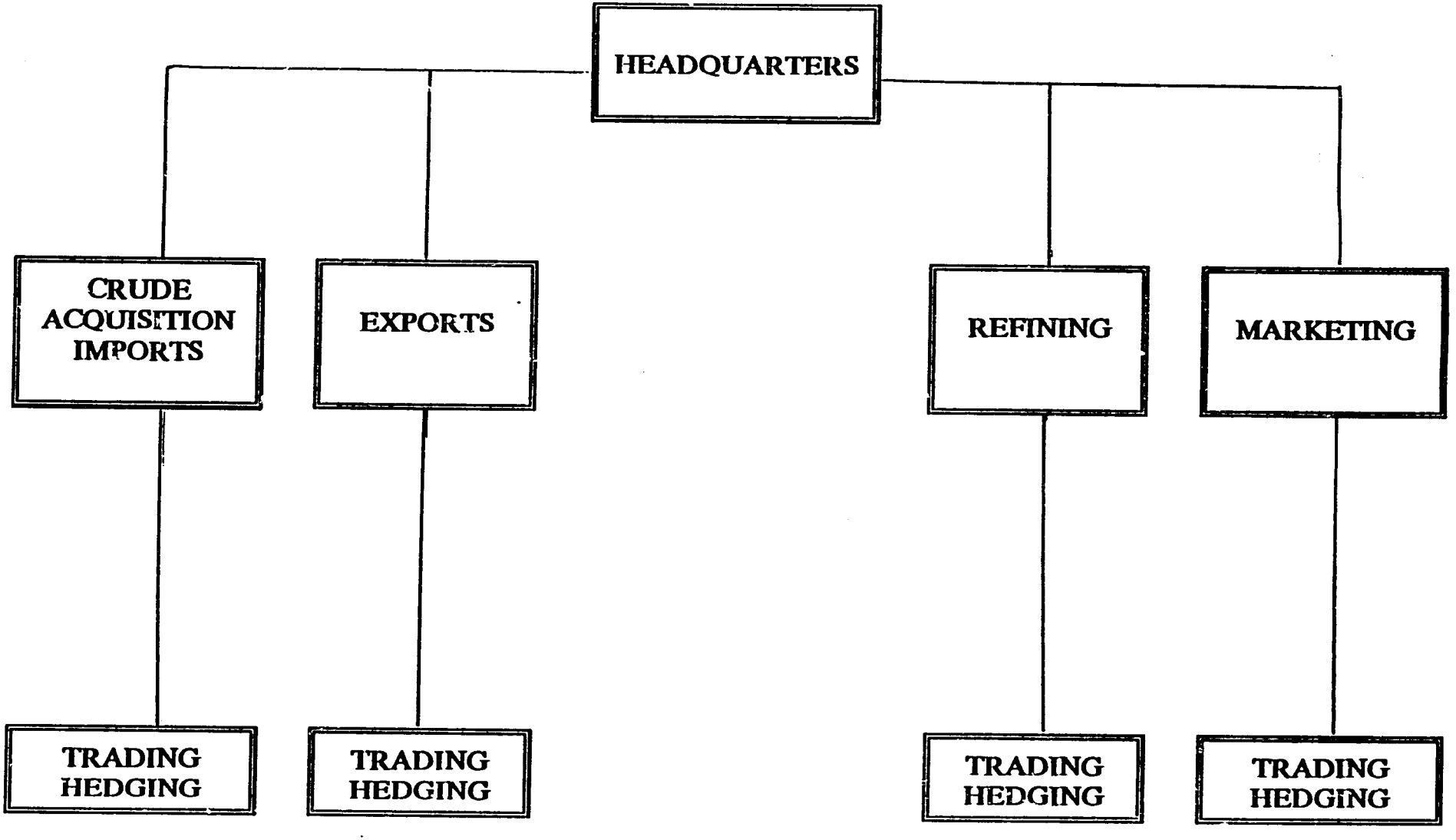
D. INTERNAL PAPER WORK FLOW:

- DAILY TRANSACTION REGISTER
- RECONCILE WITH BROKER'S CONFIRMATION STATEMENTS
- DAILY TRADE TICKETS SENT TO ACCOUNTING
- TRANSACTIONS ENTERED INTO ACCOUNTS
- CHECK AGAINST FINANCIAL, VOLUMETRIC AND STRATEGY CONTROLS
- RECONCILIATION AND INTERNAL AUDIT OVERSIGHT
- PERIODIC (WEEKLY, MONTHLY) REPORTS TO OPERATING DIVISION, MANAGEMENT

III. CENTRALIZED (COORDINATED)



II. DECENTRALIZED (UNCOORDINATED)



D. DEFINE DUTIES AND DELEGATION OF AUTHORITIES

- PREPARE A DESCRIPTION OF DUTIES AND RESPONSIBILITIES FOR EACH INDIVIDUAL IN THE HEDGING ORGANIZATION.

- PREPARE A TABLE OF AUTHORITIES TO ESTABLISH LIMITS OF AUTHORITY FOR EACH INDIVIDUAL CONSISTENT WITH ESTABLISHED GOALS.

E. TRADING SYSTEM

- TRADING RULES
- TRADE DOCUMENTATION
- ACCOUNTING
- REPORTING
- TRADING PROCEDURES

FUTURES TRADING DOCUMENTATION SYSTEM

CODES

1. **COMMODITY**

WTI	WEST TEXAS INTERMEDIATE CRUDE OIL
HHO	NO. 2 HEATING OIL
UNL	UNLEADED GASOLINE
EGO	EUROPEAN GASOIL

2. **EXCHANGE**

NMX	NEW YORK MERCANTILE EXCHANGE (NYMEX)
IPE	INTERNATIONAL PETROLEUM EXCHANGE (LONDON)

3. **BROKER**

KP	KIDDER PEABODY

TRANSACTION REGISTER
FUTURES CONTRACTS

ANSACTION NO.	COMMODITY	PURCHASE/ SALE	NYMEX IPE	NO. CONTRACTS	DELIVERY MONTH	PRICE	BROKER

3011

TRADE TICKET
FUTURES

1. TRANSACTION NO.: _____
2. COMMODITY: _____
3. TRANSACTION TYPE:
   A. PURCHASE _____
   B. SALE _____
4. EXCHANGE:
   A. NYMEX _____
   B. IPE _____
5. NO. CONTRACTS: _____
6. DELIVERY MONTH: _____
7. PRICE: _____
8. BROKER: _____
9. COMMISSION: _____
10. STRATEGY:
    SHORT HEDGE _____
    LONG HEDGE _____
11. GOAL: _____

_____

_____

_____

_____

_____

12. STOP/LOSS: YES _____ AMOUNT _____
    NO _____

_____

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BROKER REPORT
YTD CUMULATIVE/MONTH OF _____

BROKER: KIDDER PEABODY

DATE: APRIL 30, 1987

TRANS.NO.	COMMODITY	PURCHASE SALE	NO. CONTRACTS	DELIVERY MONTH	COMMISSION U.S.$
87030701	WTI	S	5	APR 87	$ 72.50
87030702	WTI	S	5	APR 87	72.50
87030702	WTI	S	15	MAY 87	187.50
87030801	WTI	S	15	JUL 87	187.50
87030802	WTI	S	20	JUN 87	250.00
87031901	WTI	P	10	APR 87	125.00
87031902	WTI	S	10	MAY 87	125.00
87032201	WTI	S	5	JUN 87	72.50
87041801	WTI	P	25	MAY 87	312.50
87042201	WTI	P	10	JUN 87	125.00
TOTALS			120		$1,342.50

BROKER SUMMARY REPORT
YTD CUMMULATIVE/MONTH OF _____

DATE: April 30, 1987

BROKER	DELIVERY MONTH	NO. CONTRACTS BOUGHT	NO. CONTRACTS SOLD	OPEN CONTRACTS LONG/(SHORT)	TOTAL CONTRACTS BOUGHT & SOLD	COMMISSIONS U.S.$
KIDDER PEABODY	APR 87	10	(10)	-0-	20	$ 250.00
	MAY 87	25	(25)	-0-	50	625.00
	JUN 87		(20)	(20)	20	250.00
	JUL 87		(15)	(15)	15	187.50
		35	(70)	(35)	105	$ 1,312.50
BROKER "X"	JUN 87	10	(25)	(15)	35	437.50
	JUL 87	-0-	(20)	(20)	20	250.00
		10	(45)	(35)	55	$ 687.50
		45	(115)	(70)	160	$ 2,000.00

HEDGING PROFIT/(LOSS) REPORT

DATE: MARCH 31, 1987
YTD CUM.:
MONTH OF: APRIL
COMMODITY: WTI

TRANS. NO.	VOLUME BOUGHT BBLS	PURCHASE PRICE U.S.$	TOTAL COST U.S.$	VOLUME SOLD U.S.$	SELLING PRICE U.S.$	TOTAL REVENUE U.S.$	COMMISSIONS U.S.$	PROFIT/(LOSS) U.S.$
87030701				5,000	18.25	91,250	(72.50)	
87030702				5,000	18.36	91,800	(72.50)	
87031901	10,000	17.75	(177,500)				(125.00)	
	10,000		(177,500)	10,000		183,050	(250.00)	5,300.00

HEDGING
MARK TO MARKET REPORT
OPEN CONTRACT MONTHS

DATE: APRIL 30, 1987
TIME: CLOSE
COMMODITY: WTI

TRANS. NO.	DEL. MONTH	VOLUME BOUGHT BBLS	PURCHASE PRICE U.S.$	TOTAL COST U.S.$	VOLUME SOLD BBLS	SELLING PRICE U.S.$	TOTAL REVENUE U.S.$	COMMISSIONS U.S.$	PROFIT/ (LOSS) U.S.$
87030802	JUN 87				20,000	17.90	358,000	250.00	
87032201	JUN 87				5,000	18.00	90,000	72.50	
87042201	JUN 87	10,000	17.50	175,500					
		10,000	17.50	175,500	25,000 Avg	17.92	448,000	322.50	

MARKET PRICE $18.05

Locked-in P/(L) 10,000 x (17.92 - 17.50) = $ 4,200.00
Exposure P/(L) 15,000 x (17.92 - 18.05) = (1,950.00)
GROSS P/(L) 2,250.00
COMMISSION PAID (322.50)
COMMISSION TO LIQ (187.50)
1,740.00

87030801	JUL 87				15,000	17.80	267,000	187.50	
					15,000 Avg	17.80	267,000	187.50	

MARKET PRICE $17.90

Locked-in P/(L) 0
Exposure P/(L) 15,000 (17.80 - 17.90) = $ 1,500.00)
GROSS P/(L) (1,500.00)
COMMISSION PAID (187.50)
COMMISION TO LIQ (187.50)
1,875.00
TOTAL OPEN MONTHS $ (135.00)

ATTACHMENT 8

HAJ:md
1987-03-11

HEDGING PROFIT/(LOSS) REPORT
YEAR-TO-DATE
CLOSED AND OPEN POSITIONS

DATE: APRIL 30, 1987
COMMODITY: WTI

DELIVERY MONTH	GROSS P/(L) LOCKED IN	GROSS P/(L) POSURE	COMMISSION PAID	COMMISSION TO LIQUIDATE	P/(L) NET
APR 87					$ 5,300.00
MAY 87	4,200.00	(1,950.00)	(322.50)	(187.50)	4,600.00
JUN 87	-0-	(1,500.00)	(187.50)	(187.50)	1,740.00
JUL 87					(1,875.00)
				CUM YTD	$ 9,765.00

TYPES OF ORDERS

(GOOD FOR DAILY TRADING SESSIONS ONLY, UNLESS OTHERWISE SPECIFIED BY TIME ORDER, "GOOD UNTIL CANCELED")

<u>MARKET ORDER</u> - BUY OR SELL AT THE GOING PRICE

<u>LIMIT ORDER</u> (NOT HELD) - BUY AT A PRICE NO HIGHER THAN OR SELL AT A PRICE NO LOWER THAN

<u>STOP ORDER</u> - BUY IF THE PRICE RISES TO X SELL IF THE PRICE FALLS TO Y AS SUCH, BECOMES MARKET ORDER. USED IN TECHNICAL SYSTEMS AND FOR LIQUIDATION.

MARKET-ON-CLOSE - PRICED DURING LAST 3-5 MINUTES OF DAILY CLOSING; CLOSEST TO SETTLING PRICE.

FILL-OR-KILL - EXECUTE IMMEDIATELY IN WHOLE OR IN PART AT SPECIFIED PRICE, OR IF NOT CANCEL.

MARKET-IF-TOUCHED - EXECUTE AT THE MARKET, IF THE PRICE REACHES THE SPECIFIED GOAL.

ACCOUNTING

CASH GAIN (LOSS) BALANCED BY FUTURES LOSS (GAIN)

PROBLEMS CAN RESULT FROM:

- TIMING DIFFERENCES
- ACCOUNTABILITY
- BUDGET CONSTRAINTS

ISSUES:

- REALIZED VS. UNREALIZED GAINS & LOSSES
- MARKING TO THE MARKET
- VALUATION IN HARD CURRENCY ($'S)
- ADOPT WESTERN ACCOUNTING STANDARDS TO EXPAND HARD CURRENCY BORROWING AGAINST HEDGED CARGOES WHERE PRODUCTS ARE RESOLD FOR HARD CURRENCY.

3,12

ACCOUNTING DUTIES

- SET UP CHART OF ACCOUNTS CONSISTENT WITH HEDGING PROGRAM GOALS
- RECORD ALL TRANSACTIONS FROM DOCUMENTS RECEIVED FROM TRADERS
- VERIFY TRADE DOCUMENTATION RECEIVED DAILY FROM BROKERS
- WHEN POSITIONS CLOSED RECONCILE CASH VS. FUTURES/OPTIONS P/(L)
- PREPARE AND DISTRIBUTE REPORTS TO MANAGEMENT AND HEDGING ORGANIZATION (USUALLY WEEKLY, MONTHLY)

F. BROKERAGE SELECTION ISSUES

- COMMISSIONS NEGOTIABLE
- MARGIN AS GOOD FAITH DEPOSIT, EARNS INTEREST
- MARKING TO THE MARKET, FINANCING
- EXECUTION CAPABILITY
- TRADES ON OWN ACCOUNT
- CONFIDENTIALITY
- COMMUNICATION ACCESSIBILITY
- BROKER FURNISHED FUNDAMENTAL/TECHNICAL MARKET ASSESSMENTS

G. CONTROLS/OVERSIGHT

I. GOALS:

- INTERNAL OVERSIGHT AT HIGHEST MANAGEMENT LEVEL

II. ELEMENTS:

- FINANCIAL AND ACCOUNTING CONTROLS AND OVERSIGHT/COORDINATION INTERNALLY
- INTERNAL AUDIT
- EXTERNAL OVERSIGHT BY APPOINTED AUDITORS, CONSULTANTS, ETC. REPORTING TO HIGHEST MANAGEMENT LEVEL

CONTROLS/OVERSIGHT

III. VOLUMETRIC LIMITS:

- SET ABSOLUTE POSITION LIMITS FOR PAPER INSTRUMENTS USED (OPTIONS VS. FUTURES)
- DISTINGUISH GROSS VS. NET LONG AND SHORT POSITIONS
- DEFINE STRATEGY - SPECIFIC LIMITS (I.E., HEDGE VS. SPECULATIVE)

IV. FINANCIAL CONTROLS:

- MAXIMUM POSITION LOSS LIMITS EXPRESSED IN $/BBL OR % OF CONTRACT VALUE
- APPLY TO SPECIFIC TRANSACTIONS OR ENTIRE ACTIVITY
- OTHER FINANCIAL CONTROLS CONSISTENT WITH PROGRAM GOALS

H. WRITTEN PROGRAM - SHOULD INCLUDE

1. DOCUMENT MANDATING GOALS AND AUTHORITIES

2. ORGANIZATION

   a. ORGANIZATION CHARTS

   b. DESCRIPTION OF DUTIES

   c. AUTHORITY TABLES

3. TRADING SYSTEM

   a. TRADING RULES

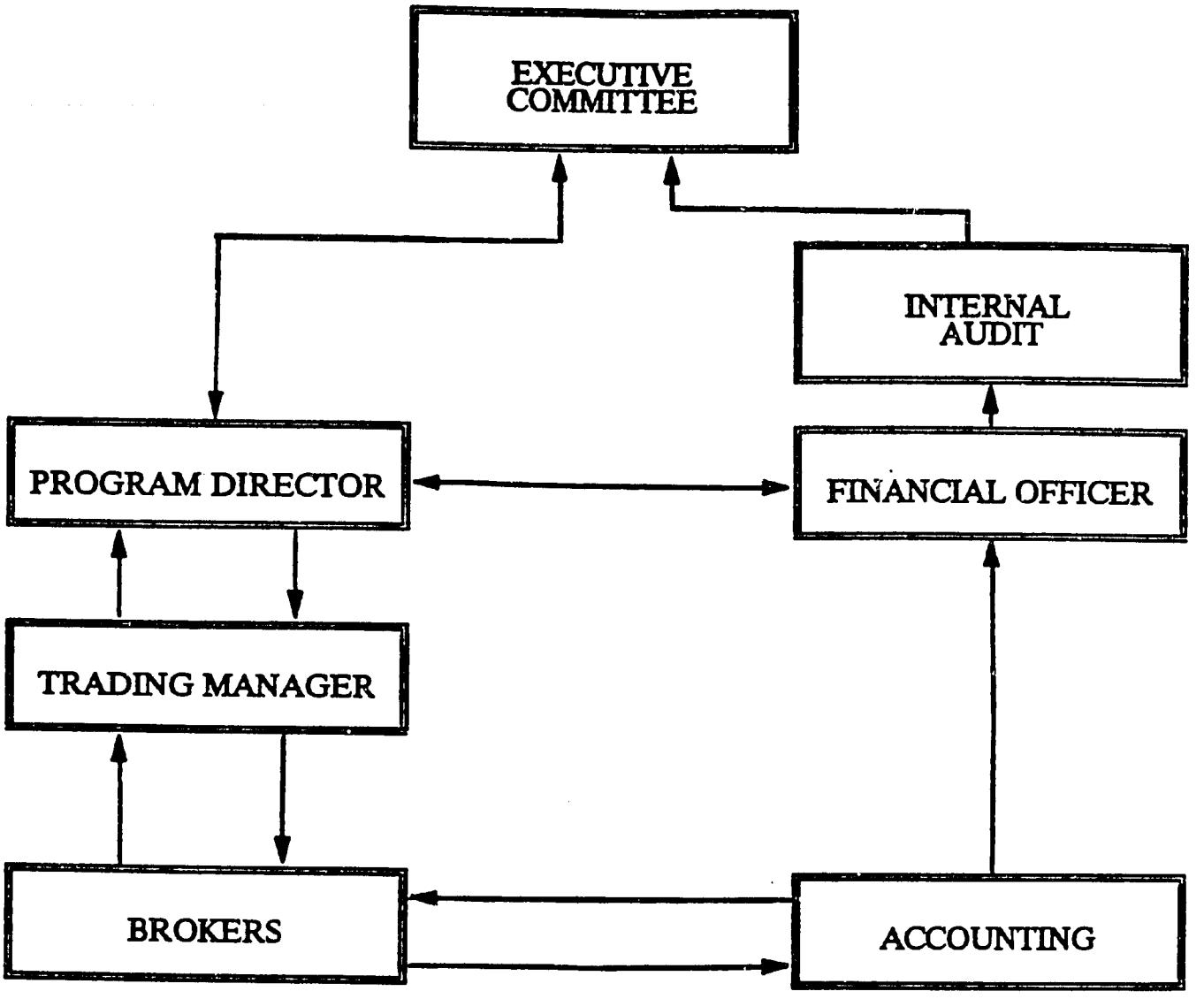
   b. DESCRIPTIONS OF DOCUMENTATION, AND REPORTS, AND THEIR DOCUMENTATION

   c. PROCEDURES WITH FLOW CHARTS

4. CONTROLS/OVERSIGHT POLICY & PROCEDURES

5. CORPORATE CERTIFICATION/RESOLUTIONS AND OTHER INSTRUMENTS EXECUTED WITH BROKERS

FLOW CHART
CONTROLS/OVERSIGHT



I. IMPLEMENTATION PROCESS

A: STRATEGY

- BEFORE ENTERING INTO FUTURES/OPTIONS TRANSACTION, TRADING MANAGEMENT/TRADERS MUST DEVELOP STRATEGY TO MEET PROGRAM GOALS

B: PLANNING

- SHORT TERM PRICE FORECASTING
- SPECIFIC CRUDE OIL MARKET FORECASTING
- PRICING CASH CRUDES
- USE FUNDAMENTAL AND TECHNICAL ANALYSIS FOR FORECASTING

NOTE: NEED "FUTURES" PLANNING, FORECASTING, RESEARCH GROUP TO SUPPORT TRADERS AND TO INTEGRATE WITH CASH TRANSACTIONS.

IMPLEMENTATION PROCESS

C. TRADING

- SELECT APPLICABLE SYSTEM/TOOLS
- DEVELOP TRADING PLAN
- TEST PLAN ON PAPER OR WITH LIMITED VOLUME
- FOLLOW SYSTEM MECHANISTICALLY
- ADJUST PERIODICALLY FOR CHANGES IN FUNDAMENTALS
- FINE-TUNE SYSTEM FOR COMPANY OR MARKET SPECIFIC VARIATIONS
- DOCUMENT PROCEDURES AND RESULTS FOR PERIODIC MANAGEMENT REVIEW

D. INTERNAL PAPER WORK FLOW:

- DAILY TRANSACTION REGISTER
- RECONCILE WITH BROKER'S CONFIRMATION STATEMENTS
- DAILY TRADE TICKETS SENT TO ACCOUNTING
- TRANSACTIONS ENTERED INTO ACCOUNTS
- CHECK AGAINST FINANCIAL, VOLUMETRIC AND STRATEGY CONTROLS
- RECONCILIATION AND INTERNAL AUDIT OVERSIGHT
- PERIODIC (WEEKLY, MONTHLY) REPORTS TO OPERATING DIVISION, MANAGEMENT

Section 15

Cash/Futures Contracting and Hedging Examples

THREE WAYS TO USE FUTURES

I. HEDGING

II. POSITIONS

III. SPREADS

TO ACCOMPLISH A VARIETY OF GOALS:

- FIX COST OR SELLING PRICE
- EXPAND MARKET SHARE
- REDUCE MARGIN RISK
- IMPROVE CASH FLOW
- REDUCE INTEREST COST
- REFERENCE CASH PRICES
- MAKE MONEY

IDENTIFICATION OF CASH MARKET APPLICATIONS:

- SHORT HEDGES AGAINST INVENTORY (IN-TANK OR ON-THE-WATER)
- LONG POSITIONS FOR ANTICIPATED VOLUME REQUIREMENTS
- LONG HEDGES AGAINST FIXED RESALE PRICE COMMITMENTS (E.G., MARKETING STRATEGIES TO END-USERS)
- SUPPORT OF TRADING OR EXCHANGE ARRANGEMENTS
- REFINING MARGINS OR CRACK SPREAD APPLICATIONS
- PROTECTION OF UPSTREAM PRODUCTION OR RESERVE VALUES

FUTURES STRATEGY

STATE OF THE WORLD	SHORT HEDGE	LONG POSITION
PRICES RISE	Gain on Inventory offset by Loss on Futures	Higher Acquisition Cost offset by Gain on Futures
PRICES FALL	Loss on Inventory offset by Gain on Futures	Lower Acquisition Cost offset by Loss on Futures

POSITIONS

(A) BUY FUTURES NOW BECAUSE MARKET LOOKS CHEAP; SAME AS PHYSICAL PURCHASE, BUT SAVES ON INTEREST COST AND STORAGE FEES.

RISK: FIXES COST EARLY,; IF PRICES LATER FALL YOU MUST STILL PAY THE NOW HIGHER PRICE.

(B) SELL FUTURES NOW BECAUSE MARKET LOOKS HIGH; SAME AS FIXED PRICE SALE, WITH COST UNKNOWN.

RISK: FIXES SELLING PRICE EARLY; IF PRICES LATER RISE, YOU MUST INCUR NOW HIGHER COSTS.

- USING FUTURES AS ALTERNATIVE TO CASH
- DEPENDENT ON MARKET TIMING
- EMPHASIZES TECHNICAL ANALYSIS
- RELIES ON RISK/REWARD OUTLOOK
- NO POSITION IS A POSITION

SPREADS

INTERTEMPORAL:

BUY ONE MONTH/SELL ANOTHER MONTH

INTERPRODUCT:

- BUY CRUDE/SELL PRODUCTS
- BUY HEATING OIL/SELL GASOLINE

INTERMARKET:

- BUY CASH/SELL FUTURES
- BUY LONDON/ SELL NY
  (arbitrage)

MARKETING

FIXED PRICE BID

3 MONTHS SUPPLY
OF JET FUEL TO COMMERCIAL AIRLINE
(¢/GAL)

NOW	MONTHS:	1	2	3	AVG.	
BUY FUTURES		75	76	77	76	
ADD OPERATING EXPENSE, DELIVERY, AND PROFIT:		5	5	5	5	
ADD BASIS RISK:		1	3	2	2	
FIXED PRICE BID			81	84	84	83

CEILING PRICE FOR COMMERCIAL ACCOUNTS

1. 6 MONTHS CONTRACT: FIRST 2 MONTHS FIXED, LAST 4 MONTHS REFERENCED TO MARKET, WITH CEILING

2. VOLUME FIRM

3. NEED EXPLICIT REFERENCE FORMULA, REVEALING MARGINS OVER FUTURES PRICES

4. PROTECT COST WITH CALL OPTIONS.

   EXAMPLE (NYMEX CRUDE PLUS MARGIN)

	AUG.	SEP.	OCT.	NOV.	DEC.	JAN.	AVG.
NYMEX CRUDE ($/BBL.)	21.00	20.80	20.65	20.60	20.55	20.50	20.68
+ OPER MGN, SEASONALITY AND INVENTORY COST	3.00	3.00	3.00	3.00	3.00	3.00	3.00
TOTAL COST	24.00	23.80	23.65	23.60	23.55	23.50	23.65
OPTIONS COST*	---	---	.57	.67	.77	.81	.47
TOTAL	24.00	23.80	24.22	24.27	24.32	24.31	24.15

* CALLS PURCHASED ON LAST 4-MONTHS VOLUME ONLY, AT AVERAGE STRIKE OF 20.68; 4 MONTH COST SPREAD OVER 6 MONTHS

5. DEFINE MARKET REFERENCE PRICE: 24.15/20.68 = 1.1678

   SO THAT BUYER PAYS NO MORE THAN 24.15, OR 1.1678 X NYMEX AVERAGE CRUDE IF LESS.

6. NYMEX AVERAGE CRUDE CALCULATED TWO MONTHS BEFORE PRODUCT DELIVERY.

7. ALTERNATIVES

   A) REFERENCE NYMEX PRODUCT FUTURES FOR CEILING

   B) SET FIRM WITH DOWNSIDE ESCAPE CLAUSE (LONG FUTURES PLUS OUT-OF-MONEY PUTS)

   C) SELL ON EFP BASIS, USING NYMEX PRODUCT FUTURES

SUMMARY OF MARKET USES

I. CARGO PRICE PROTECTION

- Short hedge crude or product futures
- Long hedge on pre-sold material
- Tie cash deal to futures

II. MARKETING

- fixed price sales
- escape clauses
- ceiling prices

III. INTERPRODUCT SPREAD

Cash: Long DFO/Short MGO

Futures: Short No. 2/Long ULG

IV. FIX CARRYING COSTS WITH INTERMONTH SPREAD

E.g. Cash: Make DFO in December for Sale in January

Futures: In November, long No. 2 DEC

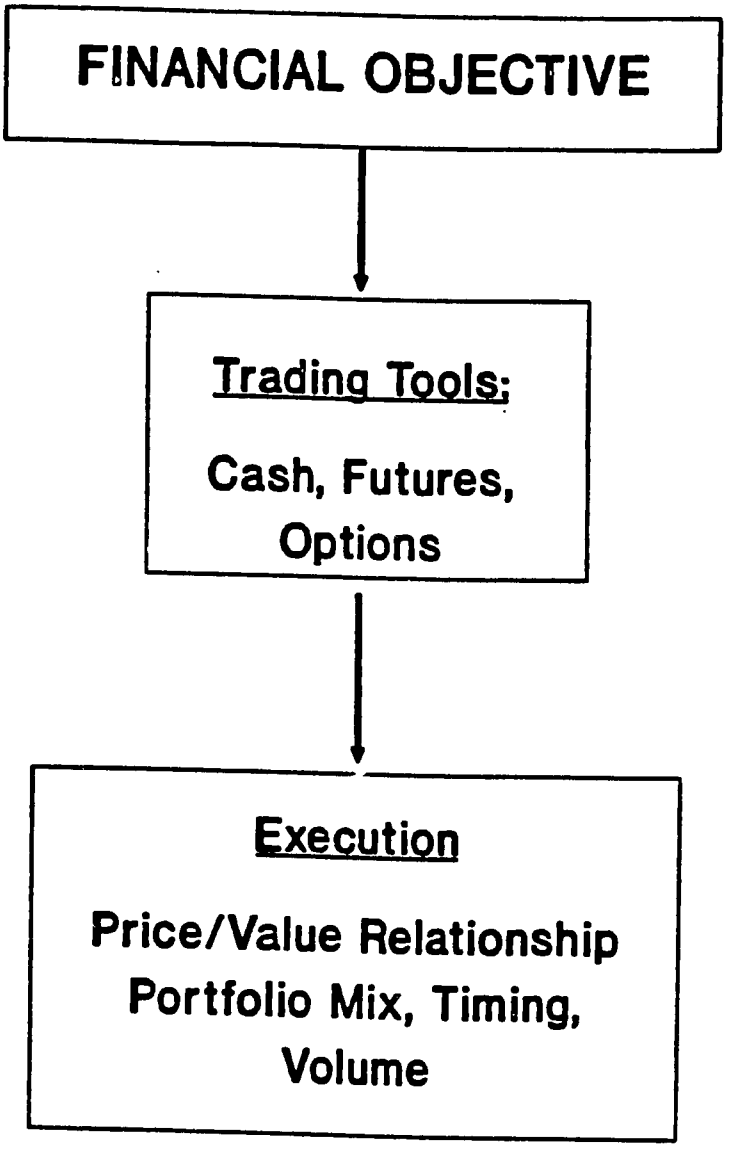
short No. 2 JAN

If spread exceeds carrying costs.

V. CRACK SPREADS

VI. HEDGING EXCHANGES

VII. REDUCING INVENTORY COSTS



- SHORT HEDGING PROTECTS VALUE OF EXISTING INVENTORY
- LONG POSITION TRANSFERS CASH MARKET RISK TO FUTURES MARKET
- SPREAD TRADING FIXES A FINANCIAL DIFFERENTIAL BETWEEN:
  - CASH AND FUTURES MARKETS
  - DIFFERENT FUTURES MARKETS

Hedging a Crude Oil Netback Purchase

Assumptions

- 500 MB of crude oil shipped in January to be priced at March gross product values, based on IPE futures prices, less negotiated refining and transportation costs.

- Refined product yield from subject crude deemed to be:

  - 40% unleaded gasoline
  - 60% gasoil

- Refiner's refinery margins are reflective of this deemed yield and GPVs (gross product values). Assumes no "basis risk" on the real margin vis-a-vis the deemed yield weights and futures price references utilized.

- Refiner (buyer) seeks to avoid a comparative deterioration in its refining margins and foregone opportunity associated with product prices rising vis-a-vis crude (i.e., an expanding crack spread).

Action

- Establish "reverse crack spread"...i.e., buying futures product and selling futures crude.

  - In January refiner buys 200 MB of March unleaded gasoline futures, and 300 MB of March gasoil futures.

  - In January refiner sells 500 MB of Mar. crude futures.

  - In February refiner pays current March futures GPV - R&T costs for crude.

  - Short crude hedge and long product hedge are liquidated as crude is priced.

Outcomes:

(1) Rising absolute prices:

A. Rising crack spreads... net reverse crack gains (product price rise > crude price rise) offset the higher netback crude price, compared to spot market levels.

B. Falling crack spreads... net reverse crack losses are offset by a lower netback crude price compared the market.

(2) Falling absolute prices:

A. Rising crack spreads... net reverse crack gains offset higher crude netback relative to spot market crude price.

B. Falling crack spreads... net reverse crack loss offset by a lower netback crude price compared to spot market levels.

Key Analytic Issues:

- Basis risk between futures crack spread (i.e., based on deemed 60/40 (gasoil/unleaded) yields, and real refinery margins. Basis risk includes yield, market price location and sales timing differences.

- Timing of crude pricing relative to product sales (example assumes contemporaneous. In practice usually a one month lag between crude costing and product sale. Could place crude hedge in February futures, product hedge in March futures to accommodate this.

- Choice of netback vs. traditional spot or processing fee supply arrangements may depend on the margin which can be secured under each approach, and the expected direction of the real vs. paper refining margins.

PRICE FIXATION CONTRACTS

- BUYER AND SELLER AGREE TO FUTURES BASED PRICING AND SPECIFIC TIME
- BASIS DIFFERENTIAL FIXED BY NUMBER OR FORMULA
- BUYER GOES LONG FUTURES TO FIX ACQUISITION COST
- SELLER GOES SHORT FUTURES TO FIX SELLING PRICE
- CAN BE INDEPENDENTLY OR SIMULTANEOUSLY
- DELIVERY ALTERNATIVES:
  - LIQUIDATE FUTURES, TRANSACT DELIVERY IN SPOT MARKI
  - STAND FOR DELIVERY, USING EXCHANGE OF FUTURES FOR PHYSICALS (EFP)

EFPs

Exchange of Futures for Physicals on NYMEX

Three Basic Forms

(1) Parties match, through brokers or directly, after entering futures market, and stand for delivery under negotiated EFP terms acceptable to the exchange.

(2) One party exchanges its futures position for another party's equivalent cash market position. For example, Party A exchanges a 1.0 MMB long crude futures position for Party B's 1.0 MMB long wet barrel/cash position, +/- a negotiated differential. Subject to appropriate documentation and exchange approval, Party A is then out of the futures market, while Party B has entered the market, via the EFP.

(3) Both parties (if commercial participants) enter the futures market together, via an EFP, at a negotiated price within the previous or current day's price range, establishing equal and opposite futures positions, without directly trading the market. Deals may be done off trading, and perhaps to avoid unfavorably moving the market.

Key Issues

- Timing... of EFP price reference (i.e., single day, moving average "window", etc.),
- Basis differential negotiated from futures price reference. (Is this difference fixed, or is it allowed to float with some market reference?)
- Accounting... extent to which EFPs enable a shifting of trading gains or losses between cash and futures market activity, thereby affecting the timing and functional location of P&L.

EFP
(Exchange of Futures for Physicals)

An example of using futures as a pricing mechanism involves independent hedging by both parties while utilizing the EFP delivery mechanism. Because EFP delivery procedures enable traders to utilize the futures market, with delivery terms individually negotiated, futures market prices on the date when the EFP is agreed upon can be used to determine the transfer price for the physical product. However, if the short and long parties to the EFP independently take their positions in the futures market, their effective transaction price, based on different futures prices, may differ from the transfer price of the physical product. A numerical illustration is shown below:

Date	Action
July 1	Company A sells short 30 August No. 2 Heating Oil contracts at $.80/gallon.
July 15	Company B buys long 30 August No. 2 Heating Oil contracts at $.75/gallon.
July 23	Company A and B agree to transact 30,000 barrels (30 contracts) for August via NYMEX's EFP delivery mechanism. August No. 2 Heating oil closes at $.78/gallon.

Results: Company A receives $.78 from Company B and receivers $.02 from broker's account, for net sales price of $.80. Company B pays $.78 and receives $.03 from broker's account, for net purchase price of $.75.

EXCHANGING FUTURES FOR PHYSICALS

EXCHANGING FUTURES FOR PHYSICALS (EFP)

	CASH MARKET	FUTURES MARKET
SEP. 15	REFINER AND MARKETER AGREE THAT NOV. GAS OIL SHIPMENTS OF 300,000 BBLS. WILL BE PRICED AT THE AVERAGE NYMEX SETTLING PRICE FOR THE NOV. FUTURES CONTRACT, AS TRADED DURING OCT.	REFINER SELLS 300 NOV. FUTURES AT $.50.MARKETER BUYS 300 NOV. FUTURES AT $.50.
OCT. 30	REFINER INSTRUCTS BROKER TO EFP WITH MARKETER, MARKETER INSTRUCTS BROKER TO EFP WITH REFINER NYMEX CLEARING MECHANISM MATCHES OFFSETTING FUTURES POSITIONS.	

CASE A	CASE B
PRICES RISE TO $.60	PRICES FALL TO $.40
REFINER'S FUTURES LOSS: $1.26MM MARKETER'S FUTURES PROFIT: $1.26MM	REFINER'S FUTURES PROFIT: $1.26MM MARKETER'S FUTURES LOSS: $1.26MM
NOV. 1 REFINER RECEIVES $7.56MM FROM MARKETER	REFINER RECEIVES $5.04MM FROM MARKETER
NET REFINER REVENUE $6.3MM NET MARKETER COST $6.3MM	NET REFINER REVENUE $6.3MM NET MARKETER COST $6.3MM

VARIATIONS

(1) REFINER AND MARKETER CAN PLACE HEDGES AT ANY TIME PRIOR TO ACTIVATION OF EFP; CAN BE DONE TOGETHER OR INDEPENDENTLY, WITH SELLING PRICE DIFFERENT THAN PURCHASE PRICE.

(2) REFINER CAN SELL NOV. FUTURES ON SEP. 15 WITHOUT HAVING SPECIFIC MARKETER DEAL, AND TRY TO FIND THE OTHER SIDE AT A LATER DATE. (ALTERNATIVE TO BUYING BACK SHORT AND SELLING SPOT)

(3) FORMULA CAN BE TIED TO AVERAGE OF SEVERAL DAYS FOR SINGLE CARGO OR AVERAGE OVER SEVERAL MONTHS FOR MULTIPLE CARGOES.

NYMEX EFP: INDEPENDENT HEDGING

	CASH MARKET		FUTURES MARKET
SEP. 15	REFINER AND MARKETER AGREE THAT NOV. GAS OIL SHIPMENTS OF 300,000 BBLS. WILL BE PRICED AT THE AVERAGE NYMEX SETTLING PRICE FOR THE NOV. FUTURES CONTRACT, AS TRADED DURING OCT.	SEP.20	REFINER SELLS 300 NOV. FUTURES AT $.60
OCT. 30	REFINER INSTRUCTS BROKER TO EFP WITH MARKETER, MARKETER INSTRUCTS BROKER TO EFP WITH REFINER NYMEX CLEARING MECHANISM MATCHES OFFSETTING FUTURES POSITIONS.	OCT. 1	MARKETER BUYS 300 NOV. FUTURES AT $.40
	PRICE AVERAGES $.50		

RESULTS:

REFINER'S FUTURES PROFIT: $.10/gal. x 300,000 BBLS. = $1.26MM
MARKETER'S FUTURES PROFIT: $.10/gal. x 300,000 BBLS. = $1.26MM

NOV. 1 REFINER RECEIVES FROM MARKETER: $6.3MM ($.50/gal. 300,000 BBLS.)

NET REFINER REVENUE $7.56MM (or $.60/gal.)
NET MARKETER COST $5.04MM (or $.40/gal)

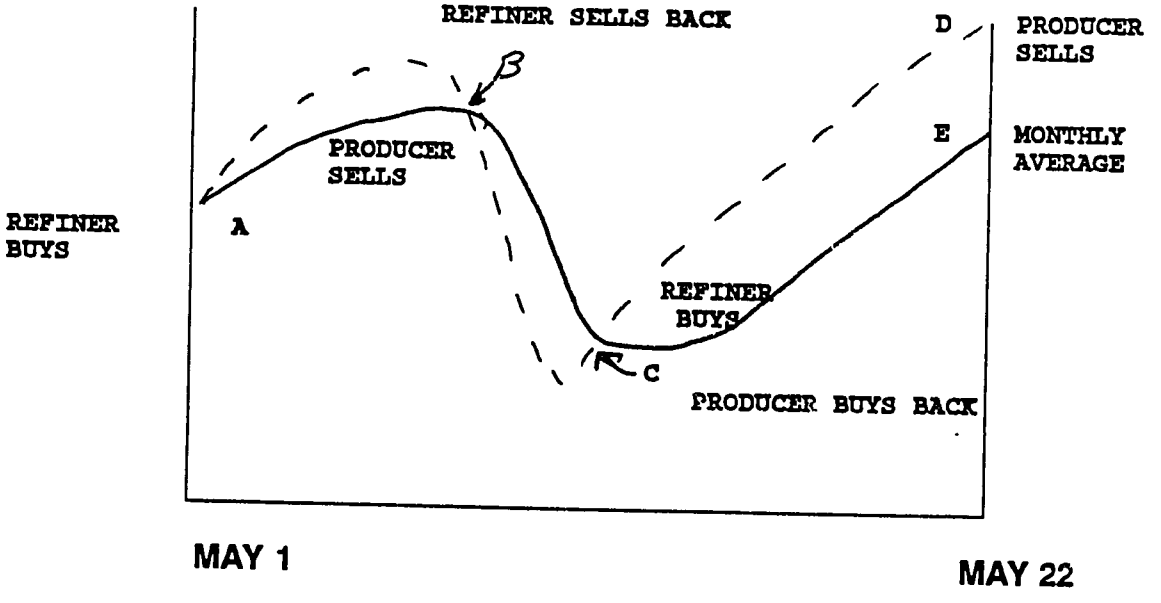
OBJECTIVE: BEAT THE AVERAGE	TAKE THE AVERAGE
METHOD: TECHNICAL ANALYSIS SYSTEMS, FULL OR PARTIAL VOLUMES	DAILY PRO-RATA VOLUMES

NYMEX - EFP

PRICE AVERAGING

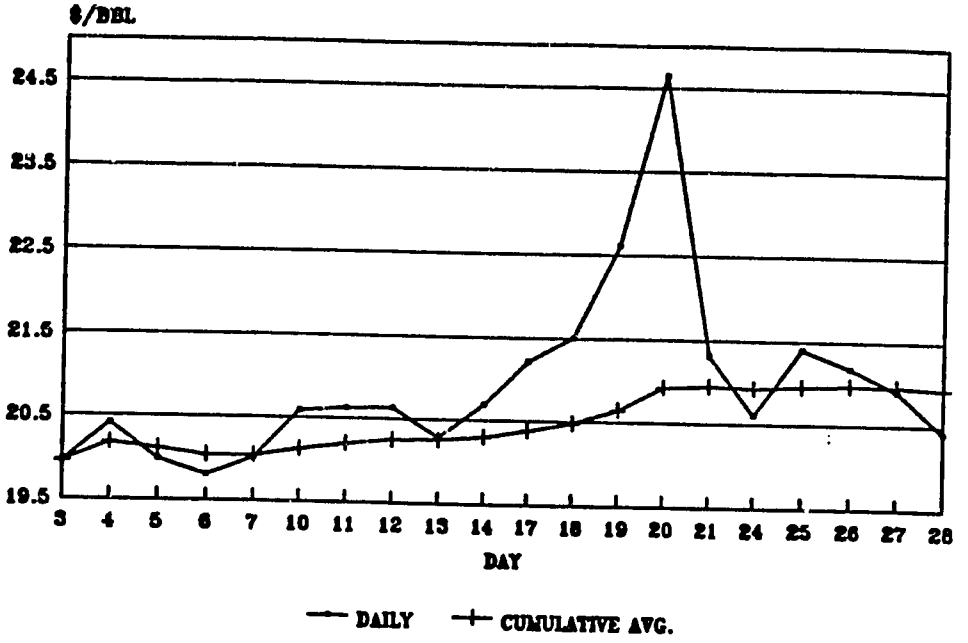
	CASH MARKET		FUTURES MARKET
APRIL 15 MAY 23	PRODUCER AND REFINER AGREE THAT JUNE CRUDE OIL SHIPMENTS OF 30,000 BARRELS WILL BE PRICED AT THE AVERAGE CLOSING PRICES FOR JUNE FUTURES CONTRACTS TRADED DURING MAY (I.E., MAY 1-MAY 22, OR 15 TRADING DAYS) PRODUCER AND REFINER EFP AT THE AVERAGE NYMEX CLOSING PRICE	MAY 1-22	PRODUCER SELLS 30 FUTURES CONTRACTS WHEN FUTURES FALL BELOW CUMULATIVE AVERAGE. REFINER BUYS 30 FUTURES CONTRACTS WHEN FUTURES RISE ABOVE CUMULATIVE AVERAGE

JUNE FUTURES



PRODUCER NET SALES PRICE: E+(B-C) + (D-E) = B-C+D
REFINER NET COSST: E-(B-A) - (E-C) = C-(B-A)
DAILY CLOSSING PRICE _____
CUMULATIVE AVERAGE _____

DAILY VS. CUMULATIVE AVERAGE NEARBY CRUDE: APRIL 1989



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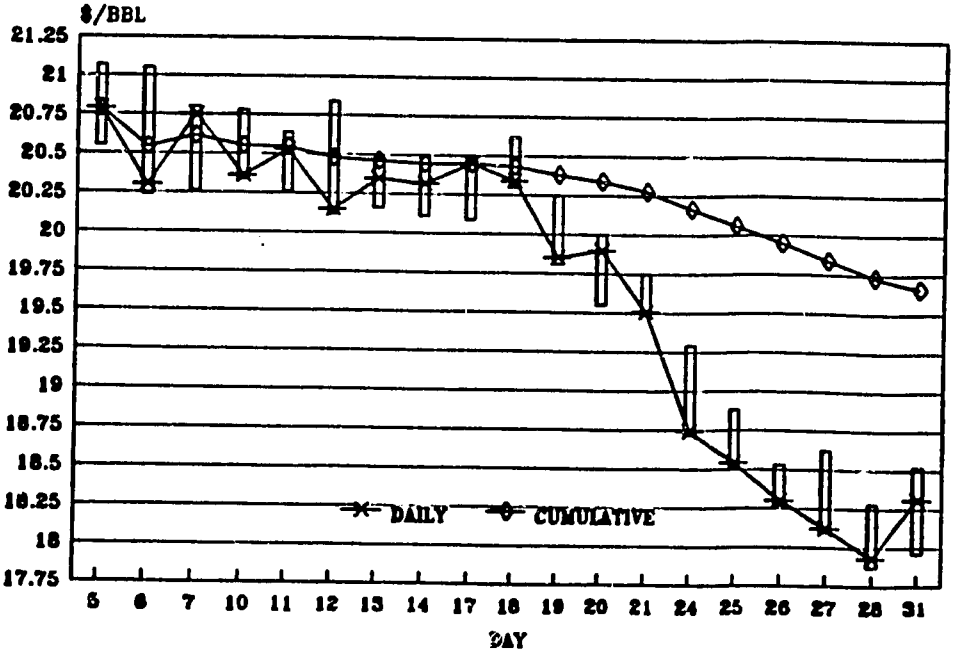
DAILY HIGH-LOW-CLOSE NEARBY CRUDE: JULY 1989



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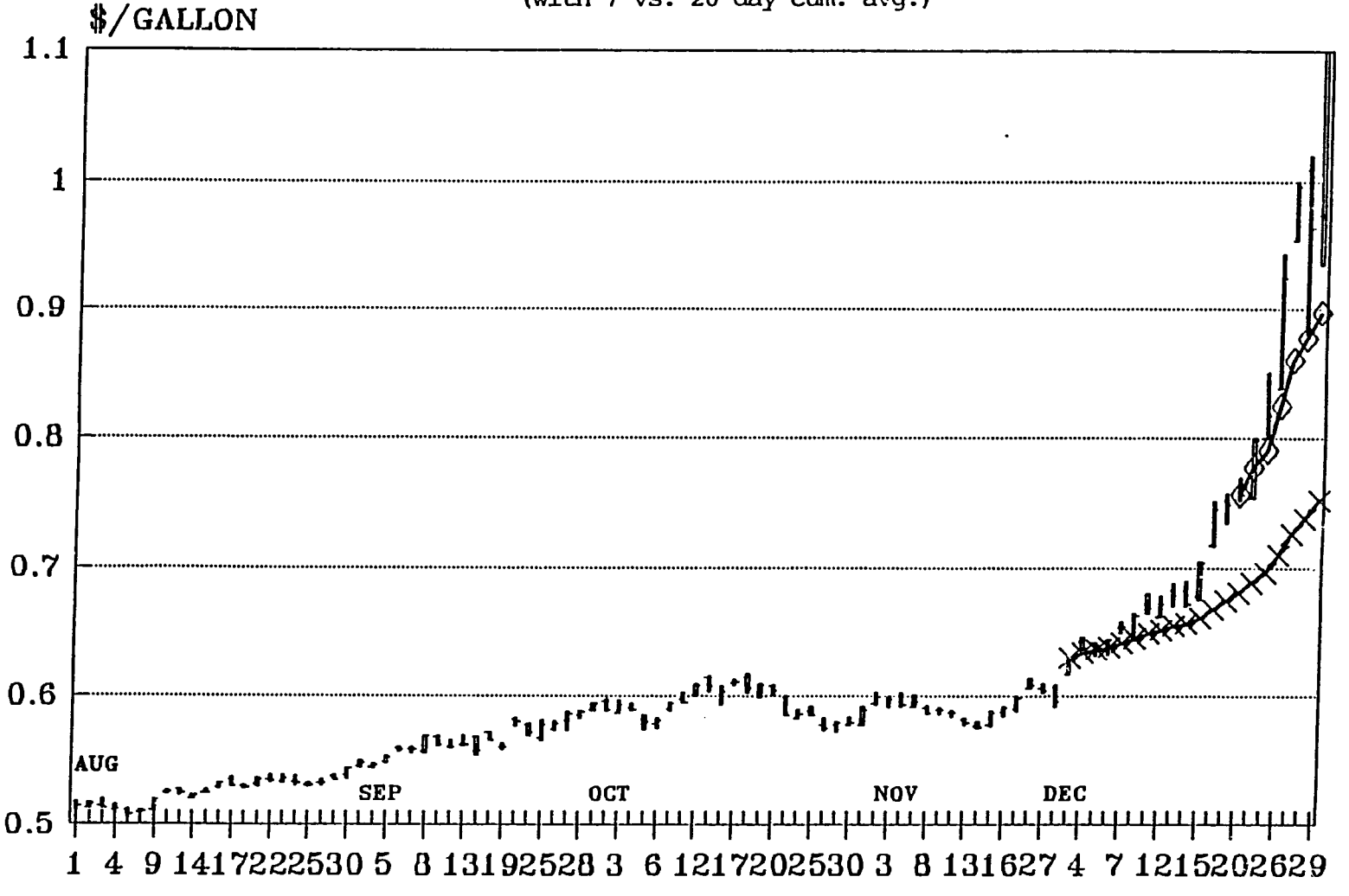
JANUARY 1990 HOIL FUTURES

(with 7 vs. 20-day cum. avg.)



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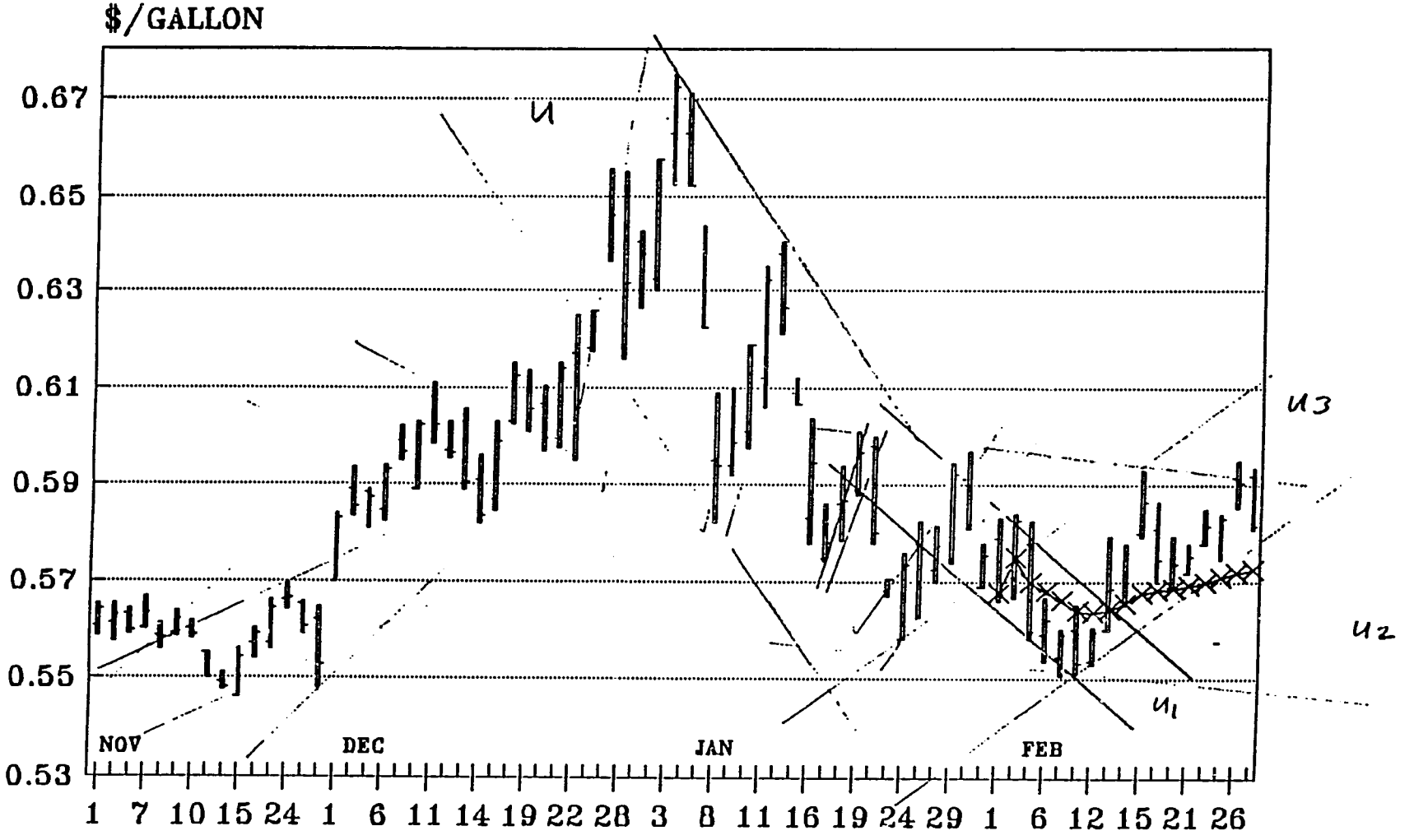
MARCH 1990 HOIL FUTURES



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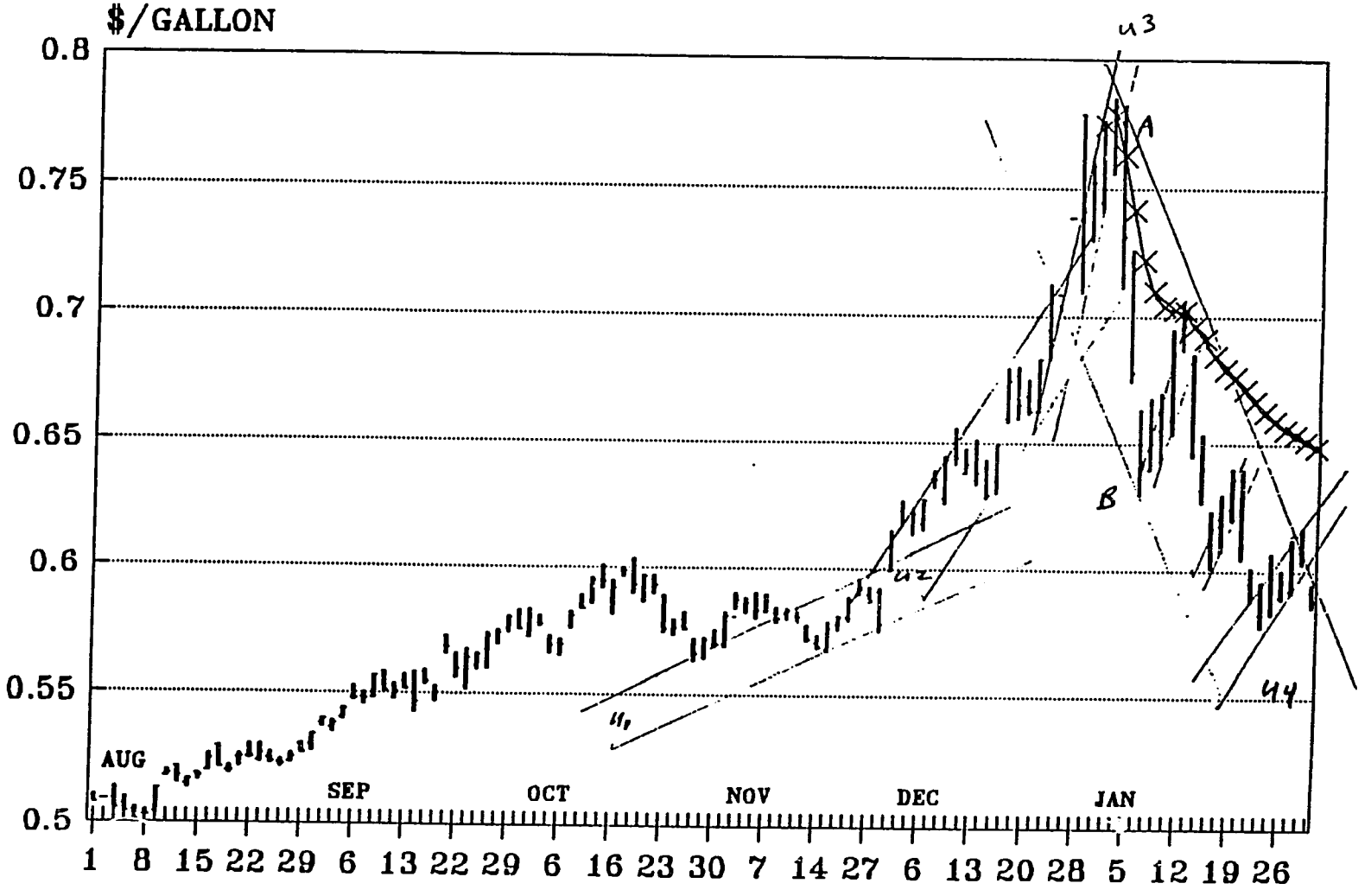
FEBRUARY 1990 HOIL FUTURES



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EFP Advantages

- Additional Source of Physical Supply
- Generates New Marketing Alternatives
- Offers Flexible, Formula-Based Pricing

  (Separates Physical Supply From Price Determination)
- Utilizes Brokers for Cash Market Trading

Applications of Trigger Pricing

(Also known as "Sell on Buyer's Call", or "Buy on Seller's Call" Contracts)

(1) Large Distributor/Terminal Operator... offers fixed-price supply from storage to marketers, for supply from one to 12 months forward, with price linked to IPE futures, and mandatory minimum lifting volumes each month.

Allows marketers to control their prices to meet competition or take advantage of fixed price sales opportunities.

(2) Option to activate a swap arrangement (aka "swaption"), whereby a premium is paid to effect a swap at a pre-determined price level in the event of a market "trigger" price being reached.

Provides full cap or floor price insurance at unacceptable "out-the-money" price levels without immediately paying option premiums for such protection. Useful when fuel budget limitations or cash flow needs justify protective price insurance, but full option costs and foregoing favorable price movement discourage an immediate and direct swap, cap or floor contract.

(3) Refiner offers trigger price to producers at the producer's discretion to exercise, subject to a crude supply commitment of at least X barrels per month.

Refiner guarantees itself a minimum volume of crude supply at a competitive floating price until fixed by the producer's trigger. At that point, refiner can forward sell products at fixed price levels to protect against declining refining margins owing to a general price decline.

Select International Crude Oil Price Formulas by Destination Market (effective April 1991)

Country	Crude Oil	Market Price Reference	Differentials ($/BBL.)	Reference Point	Timing (t=date of departure)	Price Averaging Period (Days)
I) To Rotterdam:						
Saudi Arabia	Arab Light	Forward Brent	-2.00	fob	t+45	10
Saudi Arabia	Arab Medium	Forward Brent	-3.70	fob	t+45	10
Saudi Arabia	Arab Heavy	Forward Brent	-5.00	fob	t+45	10
Iran	Iranian Light	Dated Brent	-0.60	cif	date of delivery	5
Iran	Iranian Heavy	Dated Brent	-1.70	cif	date of delivery	5
Nigeria	Bonny Light	Dated Brent	+0.30	fob	t+15	10
Libya	Es Lider	Dated Brent	-0.30	fob	t+10-15	5
Libya	Brega/Zueitina	Dated Brent	+0.70	fob	t+10-15	5
II) To Far East						
Saudi Arabia	Arab Light	(Oman+Dubai)/2	+0.85	fob	date of loading	30
Saudi Arabia	Arab Medium	(Oman+Dubai)/2	-0.75	fob	date of loading	30
Iran	Iranian Light	Oman	-0.50	fob	date of loading	30
Qatar	Qater Durkan	Oman	+0.70	fob	date of loading	30
III) To U.S. Gulf Coast						
Saudi Arabia	Arab Light (Aramco)	ANS	-0.75	fob	t+45	10
Saudi Arabia	Arab Light (non-Aramco)	ANS	+0.35	cif	date of delivery	5
Saudi Arabia	Arab Medium (Aramco)	ANS	-2.30	fob	t+45	10
Saudi Arabia	Arab Medium (non-Aramco)	ANS	-1.15	cif	date of delivery	5
Nigeria	Bonny Light	Dated Brent	+0.30	fob	t+15	10
Nigeria	Bonny Medium	Dated Brent	-0.70	fob	t+15	10
Columbia	Cano Limon	(ANS +WTI)/2	-1.10	fob	date of loading	5

Source: Petroleum Intelligence Weekly

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Section 16

Basis Risk Management

Basis Risk

(Elements)

(1) Quality - e.g., hedging kerosene with gasoil, No. 6 oil with crude, etc.,

(2) Location - e.g., hedging Med. sales in the ARA market,

(3) Timing - e.g., hedging January cash market sales with February futures,

(4) Contract Features - affecting differences in payment terms, guarantees, transaction costs, and other differences among cash and futures, forward markets.

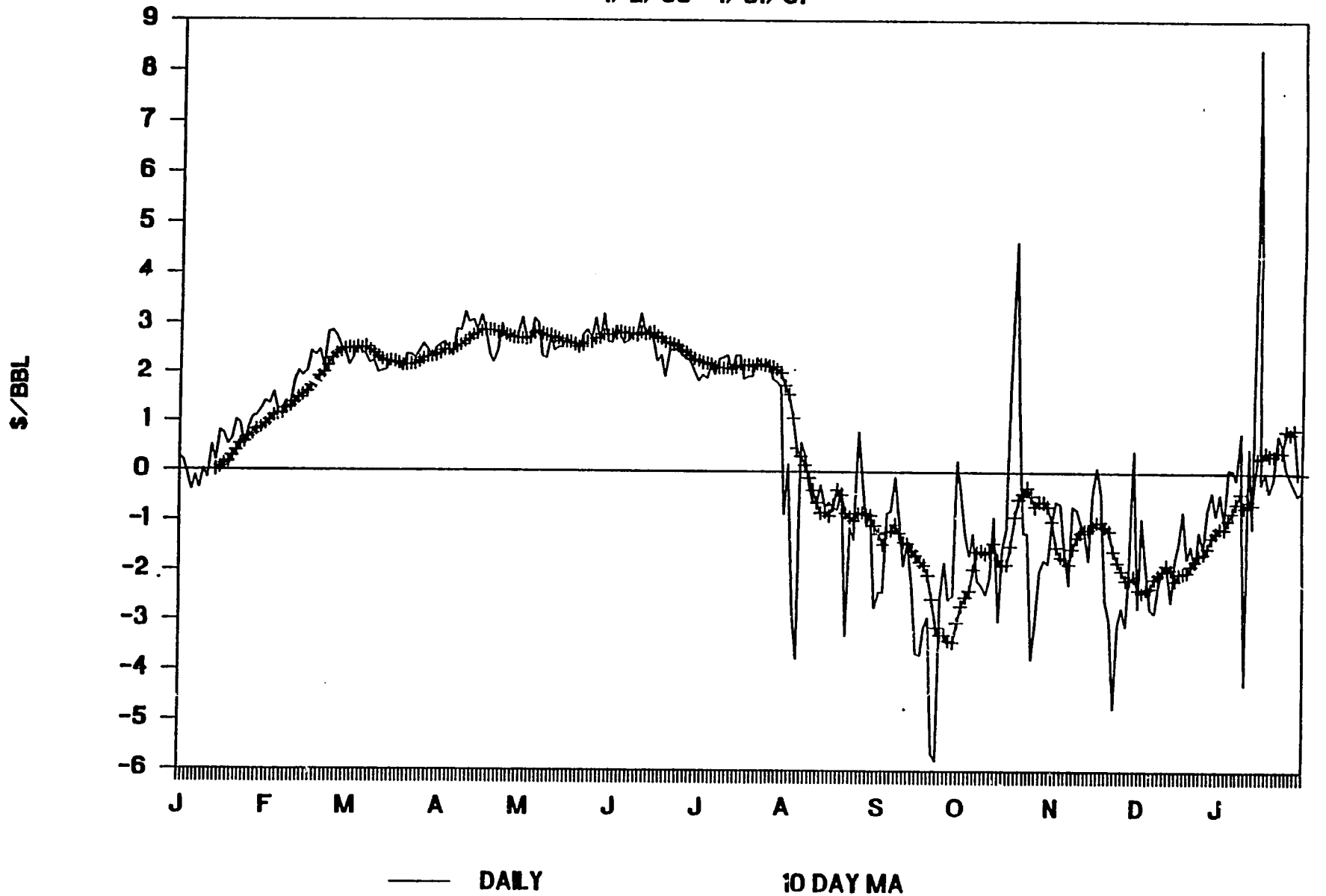
(Key Analytic Requirements)

- Document, monitor and attempt to quantify each aspect of basis risk.
- Assess each "leg" of the basis individually, using fundamental and technical analysis tools, and the basis spread in total for its determining features, seasonal and trend patterns. (Basis may move in trend and sideways channel patterns.)
- Remain flexible to negotiating fixed or floating basis differentials for trading and price referencing purposes, and attempt to time hedges and cash market positions when the basis is favorable.

The Basis Risk Can Be More Pronounced Than Absolute Price Risk

NYMEX 2ND WTI MINUS BRENT DTD

1/2/90 - 1/31/91



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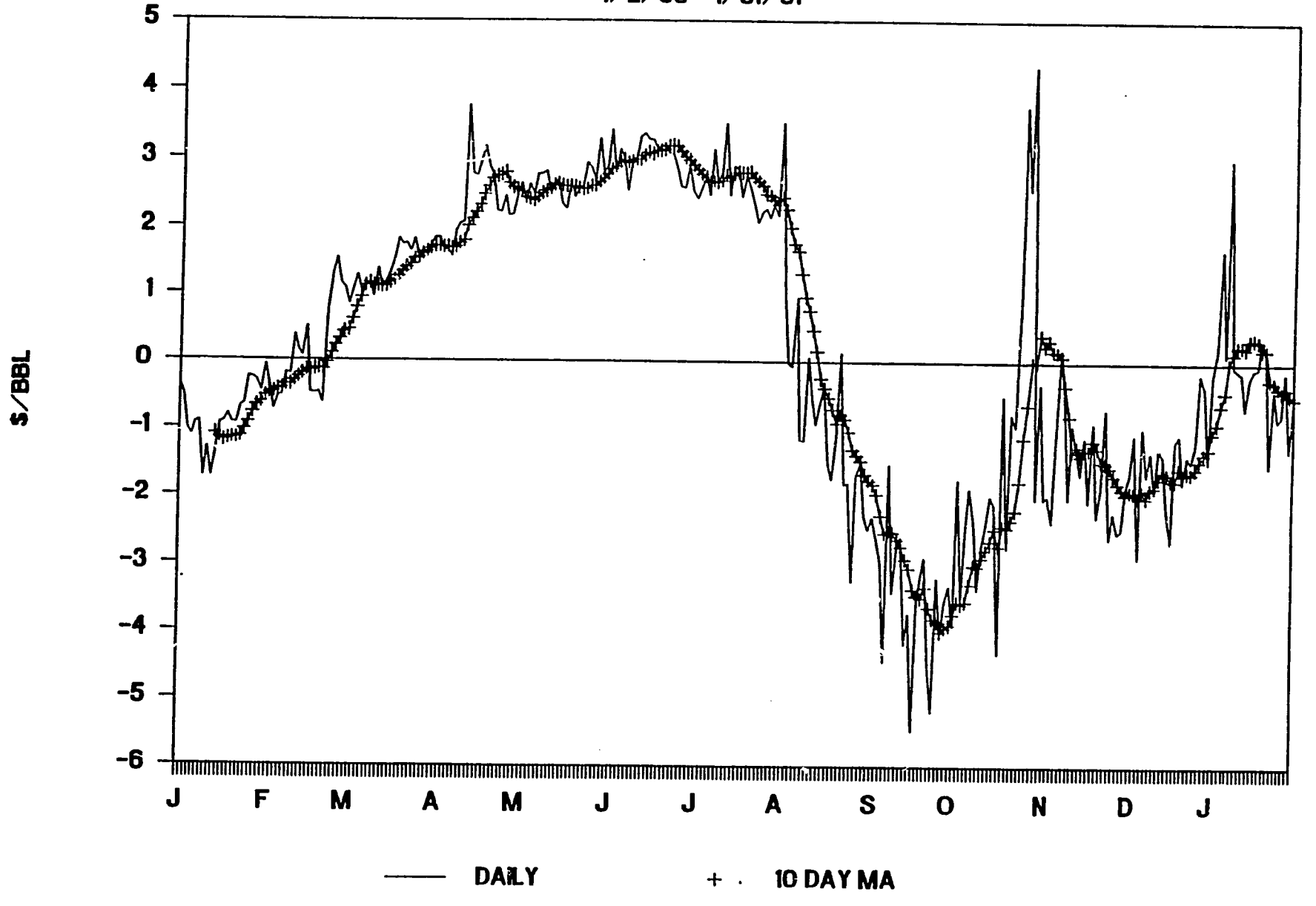
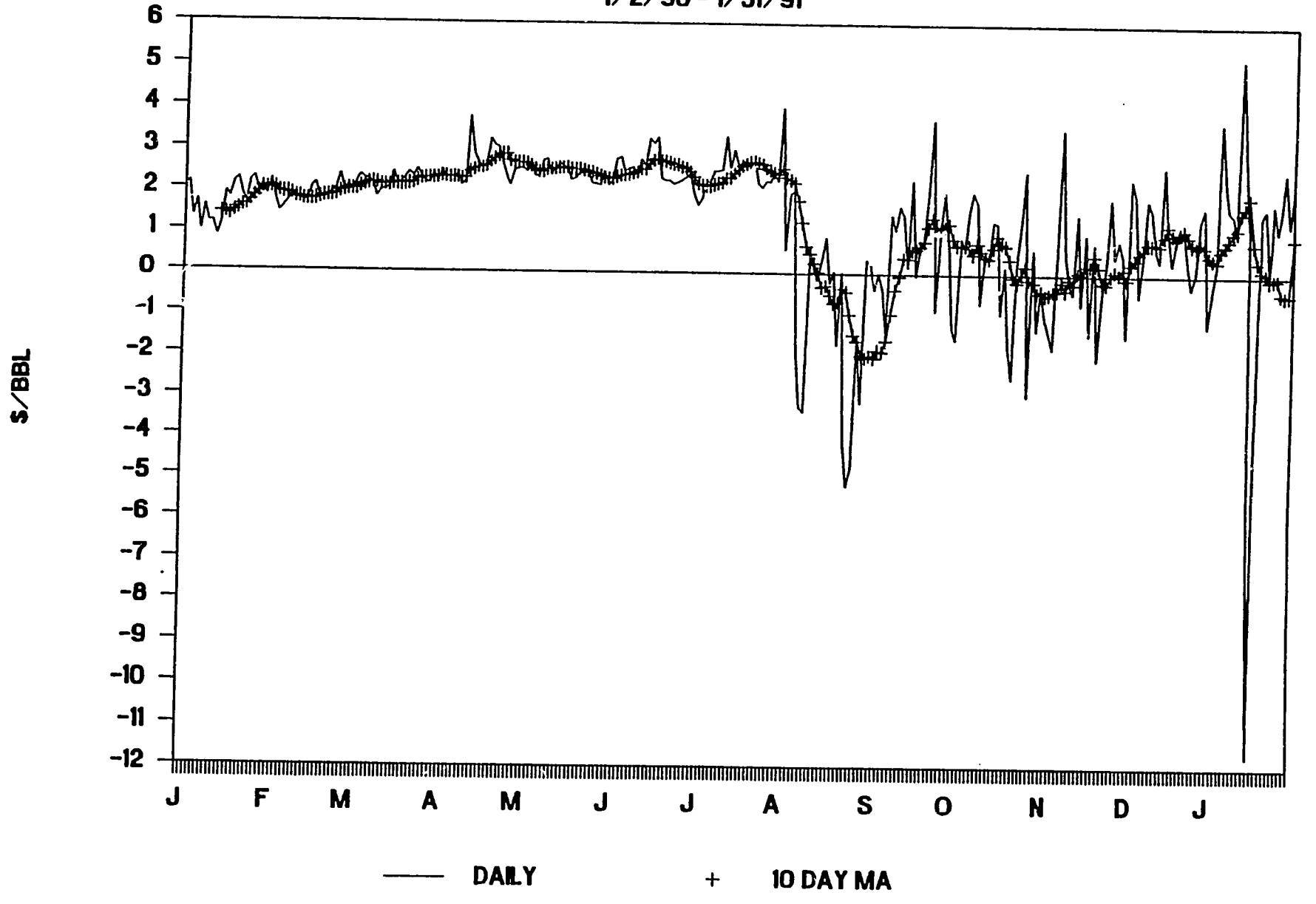
IPE 2ND BRENT MINUS URALS SPOT

1/2/90 - 1/31/91



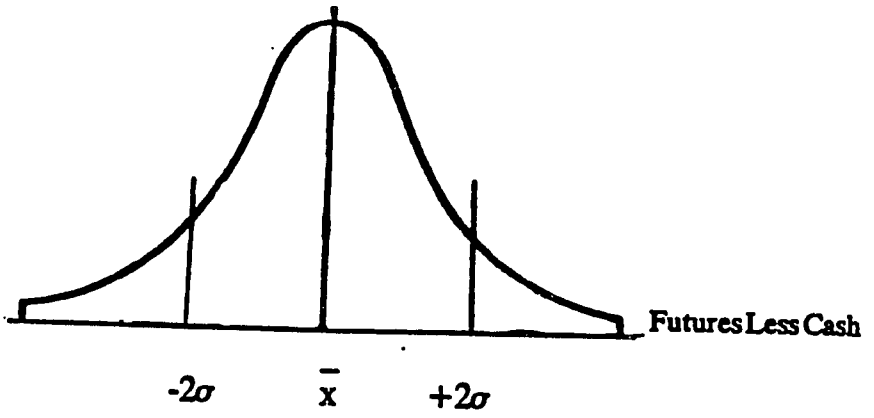
IPE 2ND BRENT MINUS ARAB LT SPOT

1/2/90 - 1/31/91



MEASURING BASIS RISK

MEASURING BASIS RISK



ILLUSTRATIVE BASIS RESULTS
POTENTIAL BASIS CHANGES

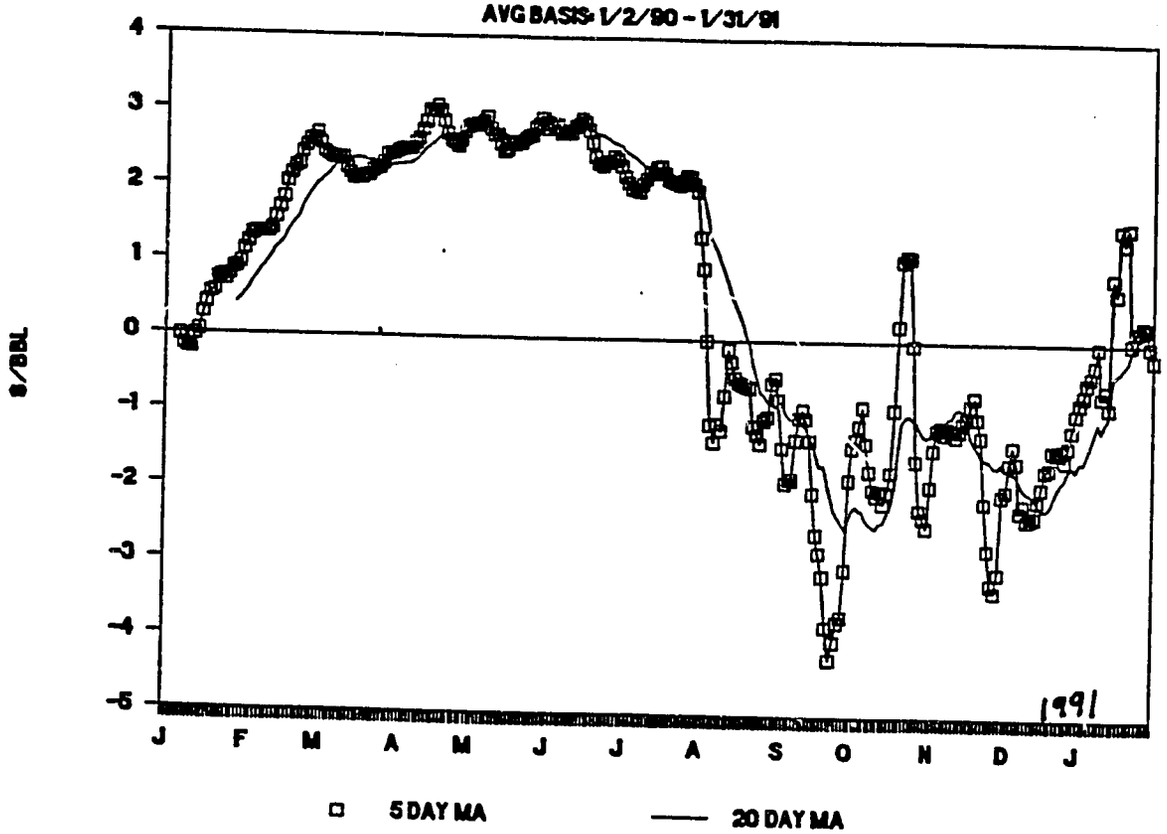
	RISING MARKET		FALLING MARKET	
	Cash Rises Less Than Futures	Cash Rises More Than Futures	Cash Falls Less Than Futures	Cash Falls More Than Futures
Cash/Futures Position (BOUGHT THE CASH/ SOLD THE FUTURES)	LOSS	GAIN	GAIN	LOSS
(SOLD THE CASH/ BOUGHT THE FUTURES)	GAIN	LOSS	LOSS	GAIN

ONGOING ANALYTICAL NEEDS:

- MONITOR FUNDAMENTALS
- TRACK $\bar{x}$ AND σ
- ADJUST FOR SEASONALITY
- DETERMINE TIMING OF BASIS MOVES (E.G., HOW LONG TO CLOSE?)

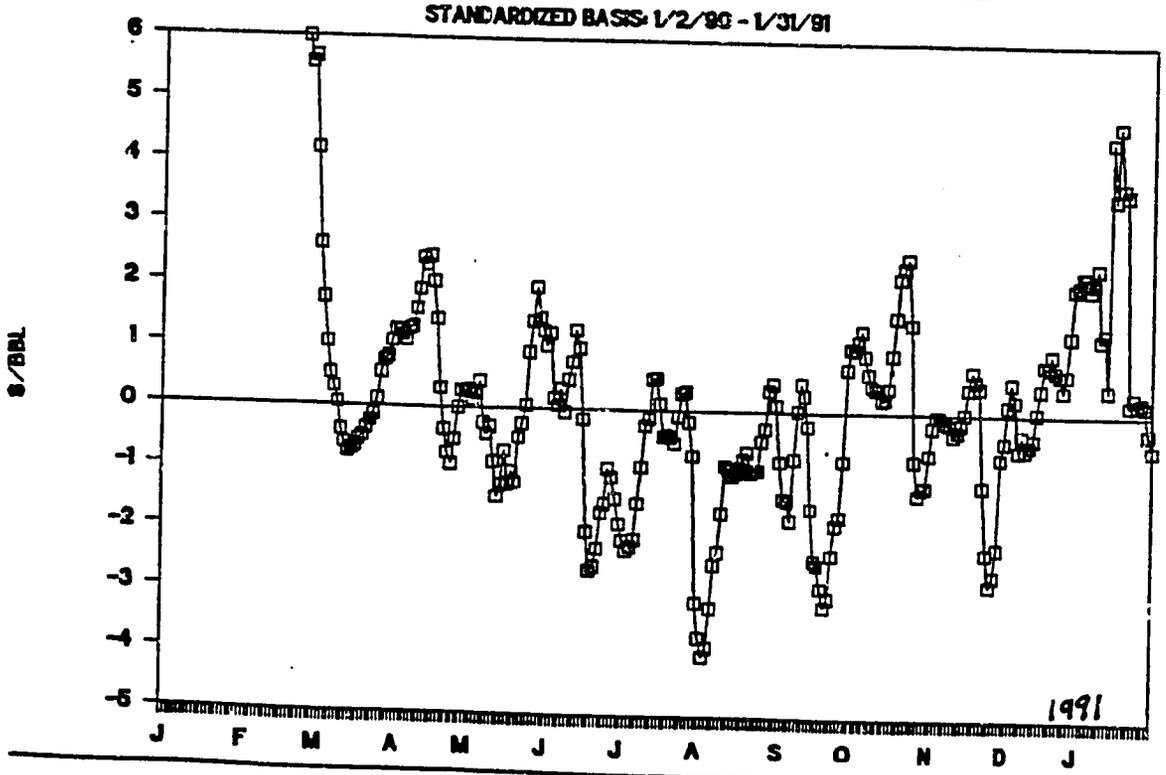
NYMEX 2ND WTI MINUS BRENT DATED

AVG BASIS: 1/2/90 - 1/31/91



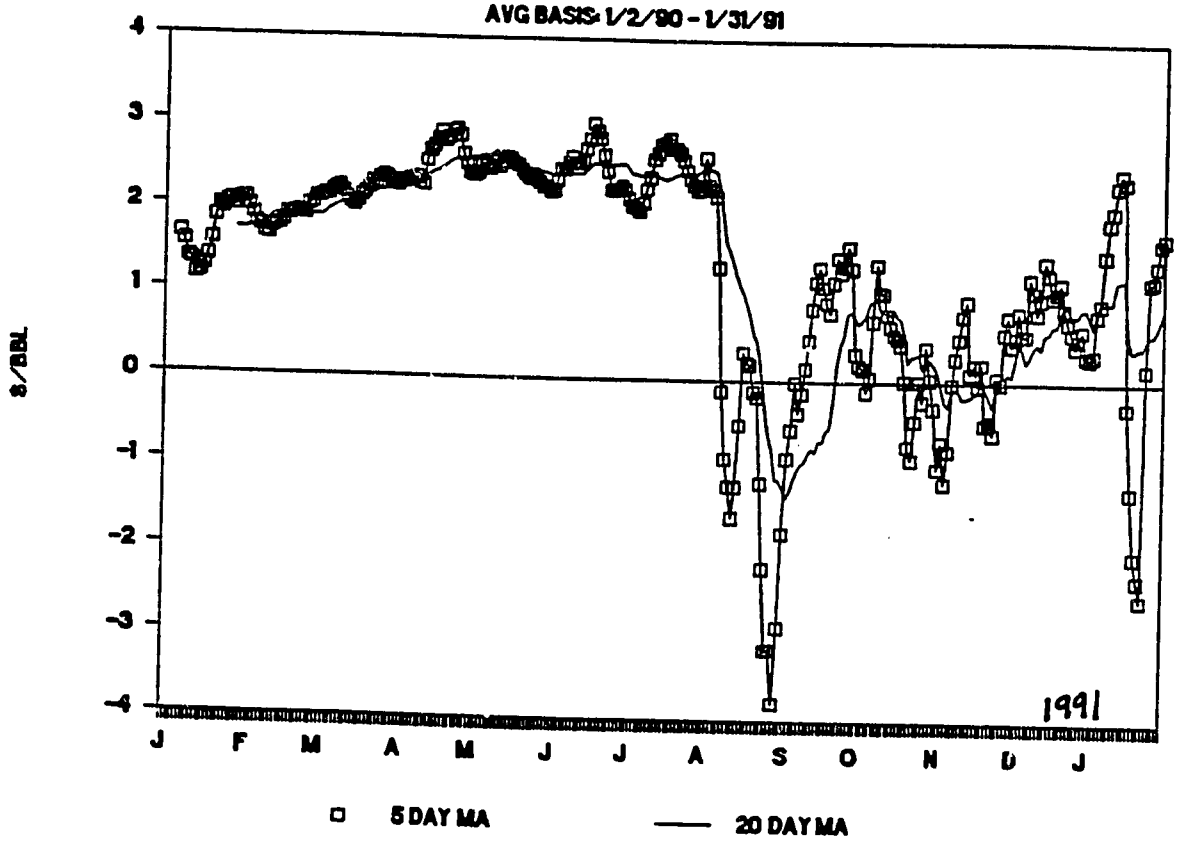
NYMEX 2ND WTI MINUS BRENT DATED

STANDARDIZED BASIS: 1/2/90 - 1/31/91



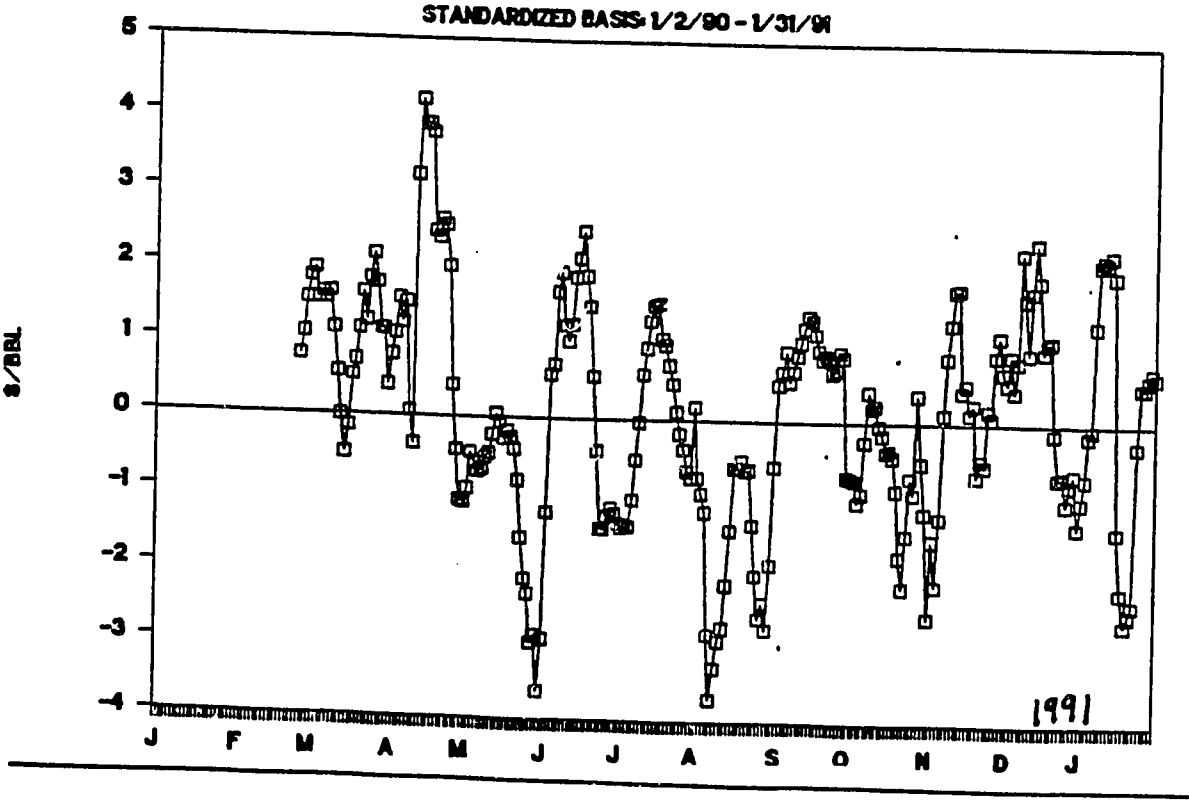
IPE 2ND BRENT MINUS ARAB LT SPOT

AVG BASIS: 1/2/90 - 1/31/91



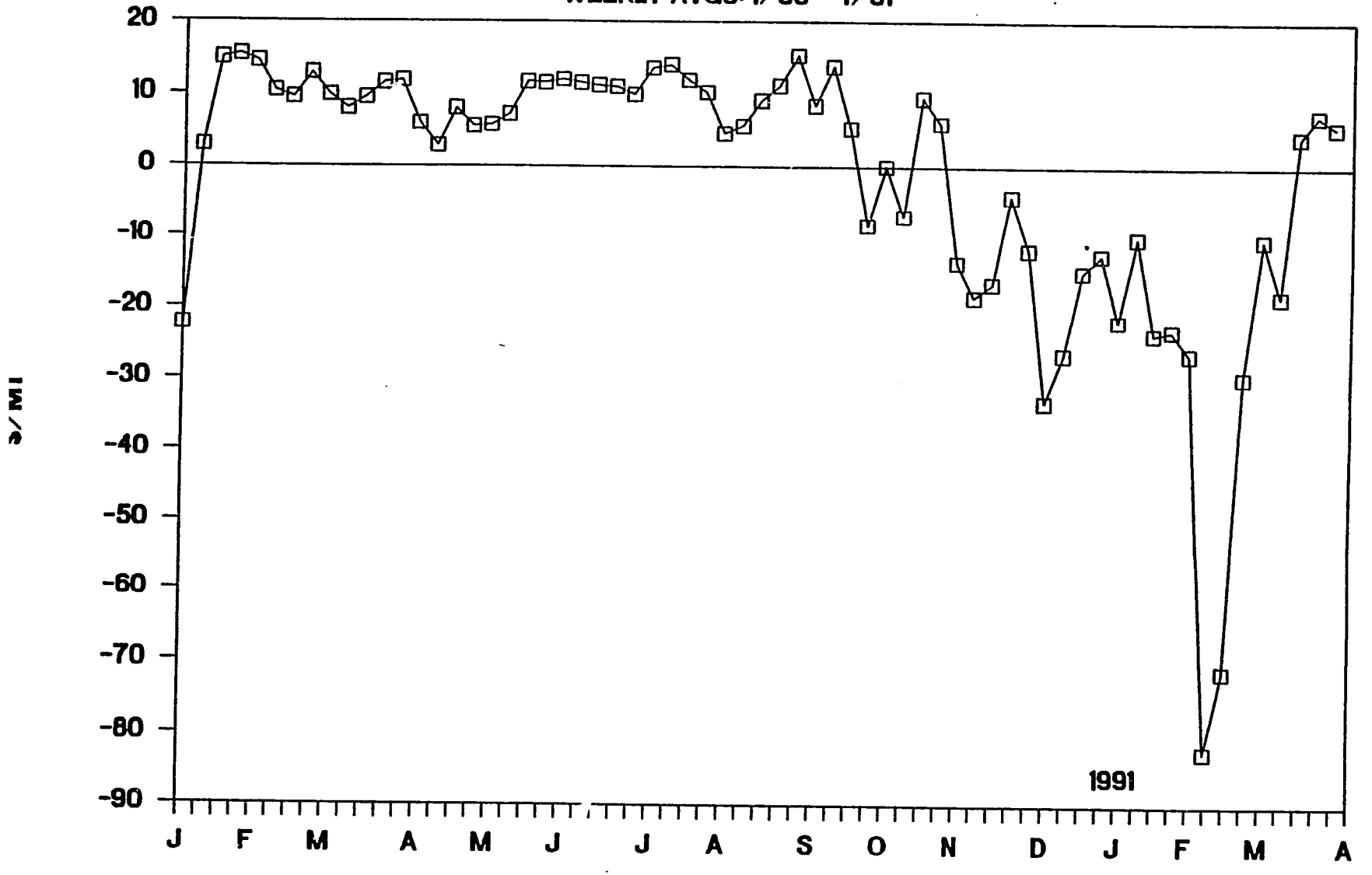
IPE 2ND BRENT MINUS ARAB LT SPOT

STANDARDIZED BASIS: 1/2/90 - 1/31/91



NYMEX 2ND HOIL - IPE NRBY GASOIL

WEEKLY AVGS: 1/90 - 4/91



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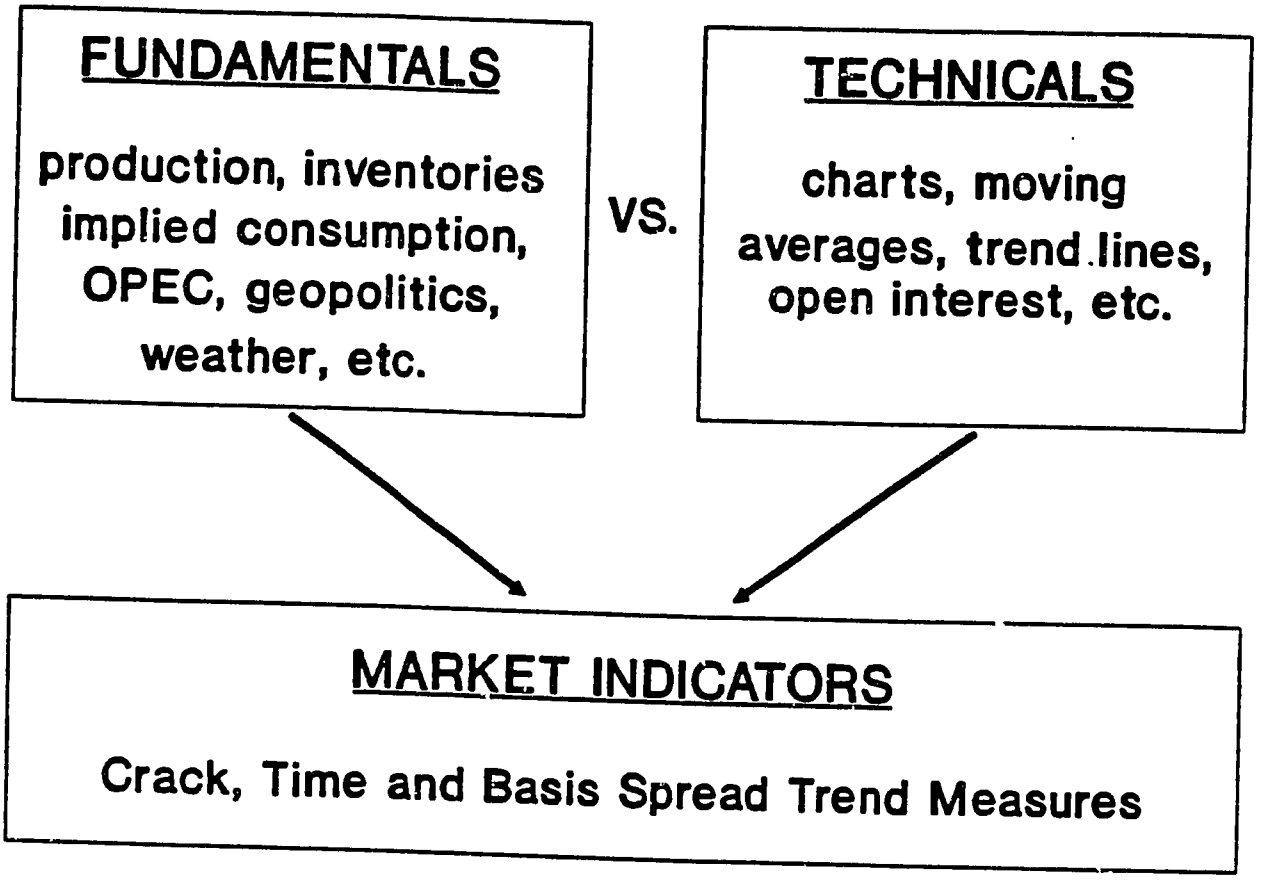
Section 17

Technical Analysis Systems

MARKET INDICATORS



Goal: To integrate various indicator systems into a timely and consistent set of indicators which can be interpreted in fundamental terms, but whose measurement techniques resemble the more precise procedures of technical analysis.

Technicals vs. Fundamentals

Technical Analysis: The measure of the market's internal behavior (i.e., price and volume) in an effort to identify market trends and make predicative price assessment.

vs.

Fundamental Analysis: The measure of the market's external forces, including supply, demand, commercial, institutional and exogenous variables in an effort to identify market trends and make predictive price assessments.

Technical analysts assume that all relevant fundamental news is immediately reflected in the market's internal information and, therefore, not useful on its own as a trading aid. By contrast, the fundamental analyst assumes that the market is not capable of immediately and correctly interpreting all relevant fundamental variables.

TYPES OF TECHNICAL ANALYSIS

- <u>Three basic Structures:</u>

  1) Trend Systems (through point A, to point B or indefinite)

  2) **Price Only** Support-resistance System (off point A, back to point C)

  3) **Volume and Price** Volume and open interest systems of both type (1) and (2)

- <u>Types of Technical Tools:</u>

  1) Charting Techniques (1), (2), and (3)

  2) Moving Averages and Parabolic Systems (1)

  3) Relative Strength Index and Directional Movement System (1) and (2)

  4) Momentum and Oscillator Systems (1) and (2)

  5) Stochastics and Channel Systems (2)

  6) Open interest, demand index, equi-volume and other type 3 systems

- <u>Timing:</u>

  Monthly average, weekly, daily (on close), intra-day

- <u>Goal:</u>

  To match the relevant price or price-spread relationships to the type of system(s) which best measure and predict the series' future behavior.

USE OF TECHNICALS

- IMPROVE TIMING OF POSITION AND ENTRY AND EXIT (FUTURES, OPTIONS OR CASH)
- CONFIRM OR CONTRADICT OTHER PRICE INDICATORS OR FUNDAMENTAL INFORMATION
- BETTER UNDERSTAND THE MARKET'S "CHARACTER" (I.E., ITS PRICE TREND, VOLATILITY AND TRADING RANGE) IN WHICH TO EXECUTE A HEDGING STRATEGY

BENEFITS OF TECHNICALS (VS. FUNDAMENTALS)

- TIMELINESS
- QUANTITATIVE (MORE OBJECTIVE) CHARACTER
- ATTENTION OF TRADE-MARKET REACTS TO THEM
- VARIETY OF READINGS (CONFIRMING OR CONTRADICTING SIGNALS)
- TESTABILITY IN HINDSIGHT

TRENDLINE TECHNIQUE

I. Initial predicted Trendline

A. Look for the lowest point of the downleg that was completed just before the final bottom was made. This is the penultimate low.

B. The channel guideline starts on the penultimate intra-day low. This will be connected to the highest point on the upleg. (This point may be modified later.)

C. The Parallel Predicted Trendline will be drawn parallel tangent to the outermost intra-day low point between the two points defining the channel guideline.

D. The parallel lines indicate a zone of support that should stop any declines.

E. Do not use this trendline if the penultimate low or high, or the initial leg of the trend cannot be identified.

II. The Intermediate Predicted Trendline

A. Start after the downward movement of the initial upleg is finished.

B. Draw the channel guideline through the extreme closing prices.

C. Draw the Intermediate Predicted Trendline parallel to the channel guideline across the outermost intra-day low that lies between the closing price used to draw the channel guideline.

D. The Intermediate Predicted trendline is a support zone, not a final valid trendline.

III. Final Predicted Trendline

A. The guideline and the Final Predicted Trendline is drawn in the same manner as the Intermediate Predicted Trendline.

B. The Final Predicted Trendline should lean towards the horizontal or very close to vertical.

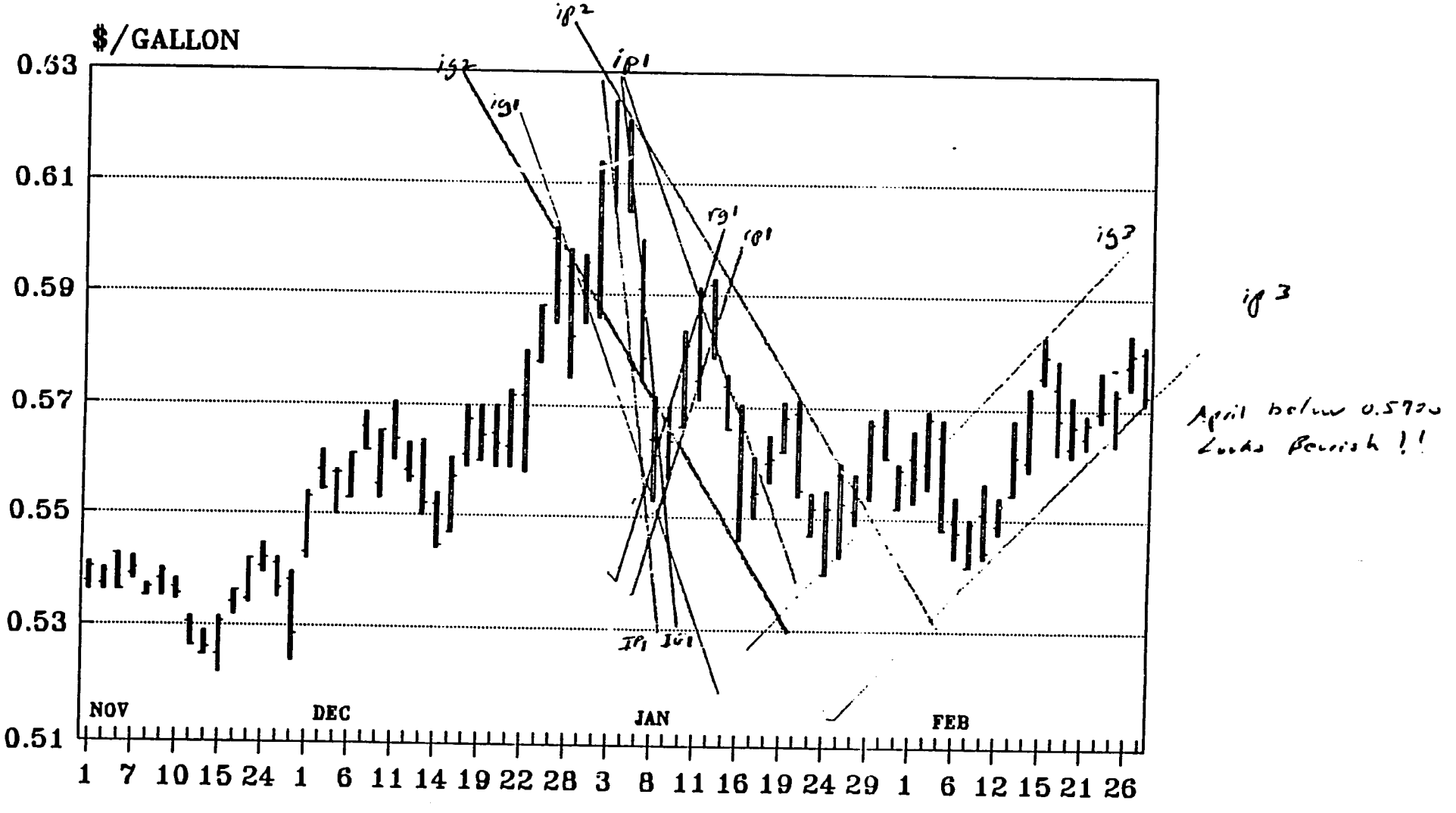
C. The Final Predicted Trendline is a support line and is also a valid signal to the end of a bull trend when downside penetration occurs.

IV. Reaction Predicted Trendline

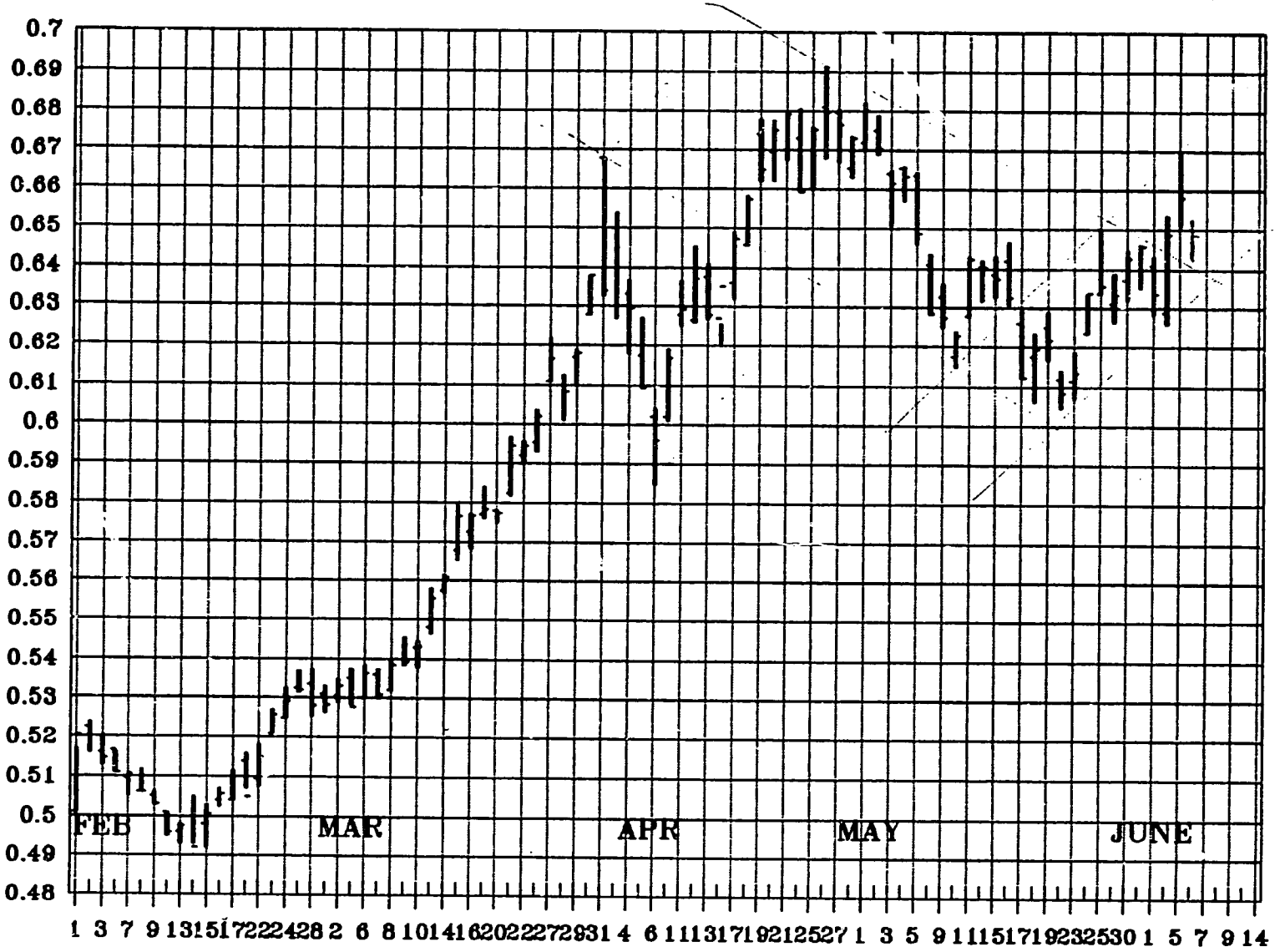
A. In a downward reaction (within a bull trend) the channel guideline is drawn through the outer most closing prices of two or more dips.

B. The Reaction Predicted Trendline is drawn Parallel across the outermost intra-day high on the downward reaction.

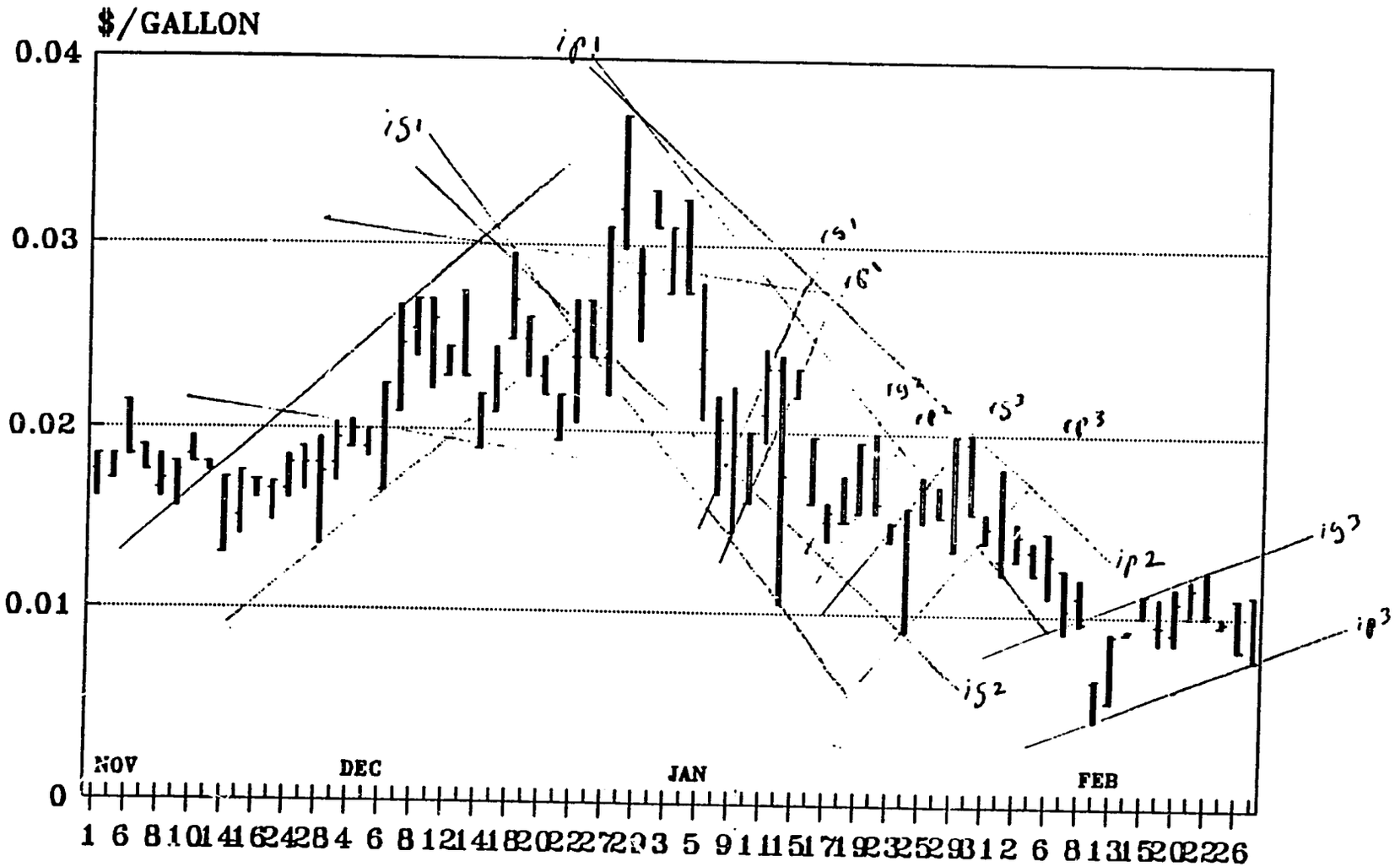
APRIL 1990 HOIL FUTURES



JULY UNLEADED



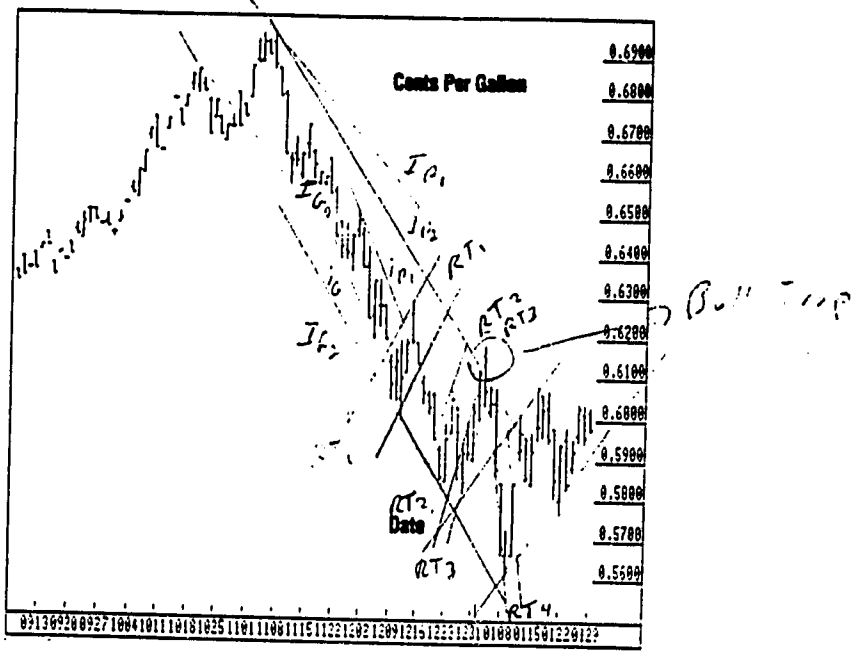
APRIL MINUS MAY 1990 HOIL FUTURES



April-May spread is in 0.0080 looks Bearish !!

Key Petroleum Refining Indicators

Gasoline Futures (NYM)—Unleaded Regular, April Delivery

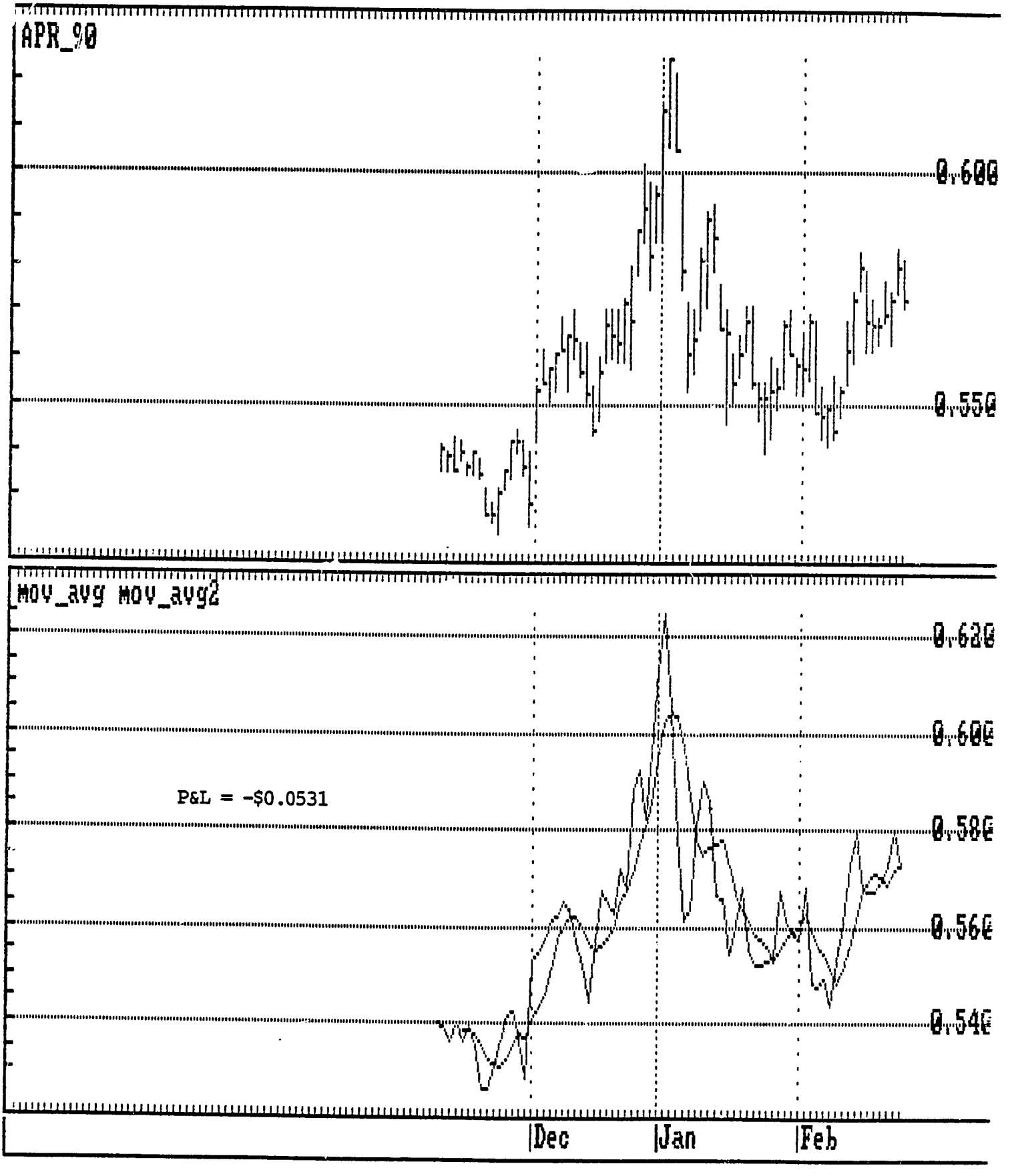


Source: Knight-Ridder Tradecenter.

Heating Oil Futures (NYM)—No. 2 Oil, April Delivery

Source: Knight-Ridder Tradecenter.

April 1990 NYMEX Heating Oil Contract: 1 vs. 5 Day Moving Average
CompuTrac/SNAP version 3.1



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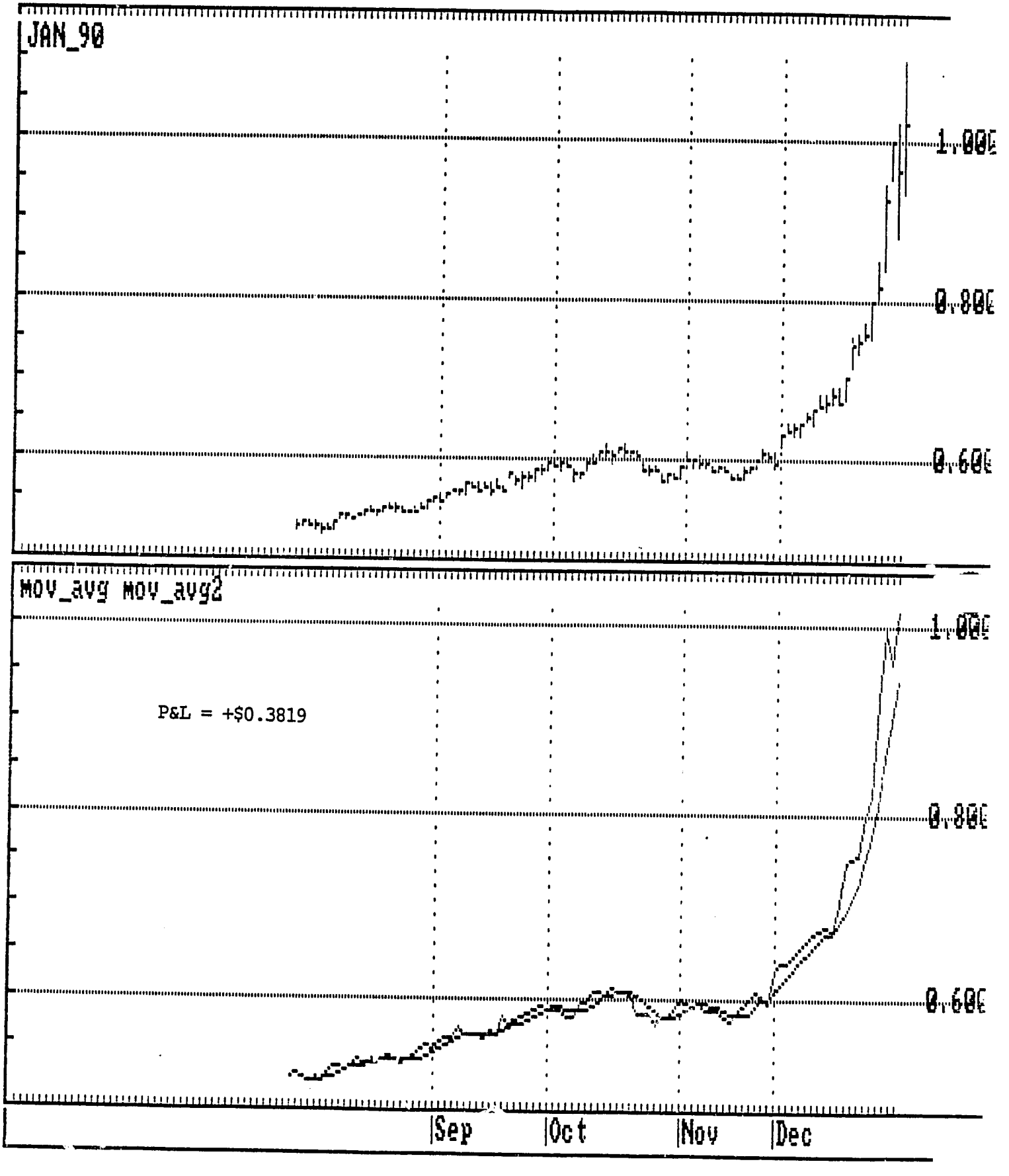
January 1989 NYMEX Heating Oil Contract: 1 vs. 5 Day Moving Average
CompuTrac/SNAP version 3.1



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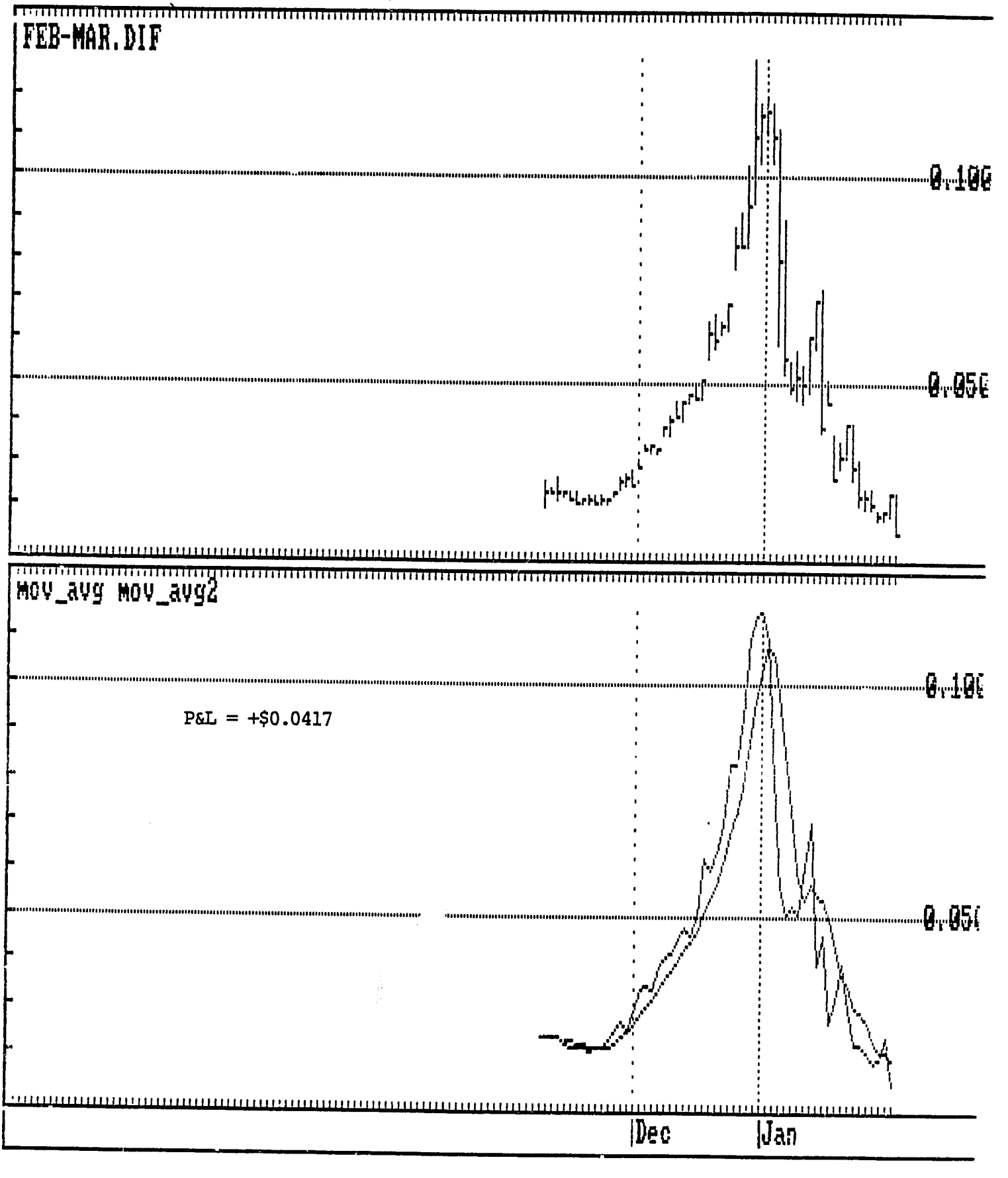
FEBRUARY-MARCH HEATING OIL SPREAD: 1 VS 5 DAY MOVING AVERAGE
CompuTrac/SNAP version 3.1



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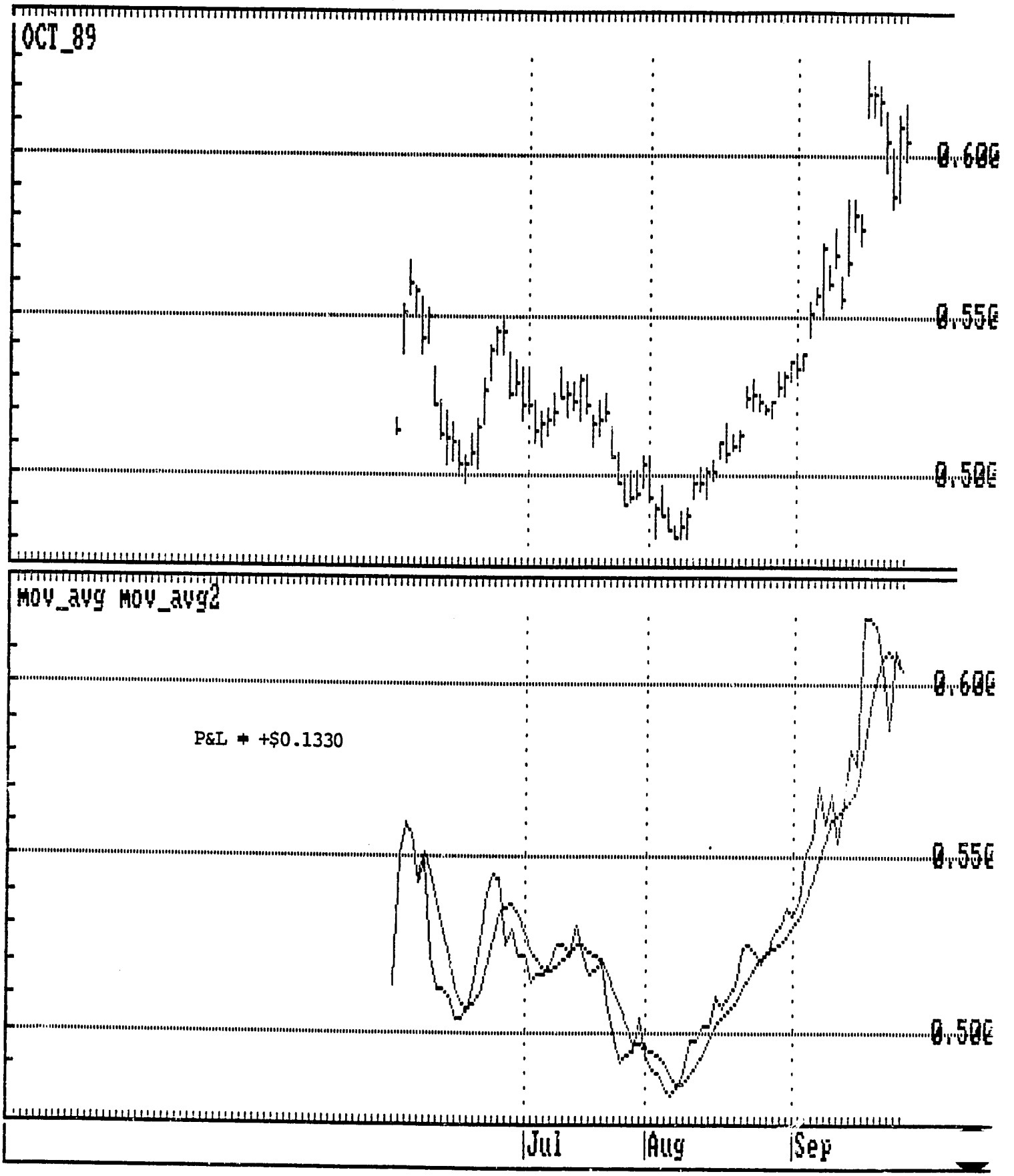
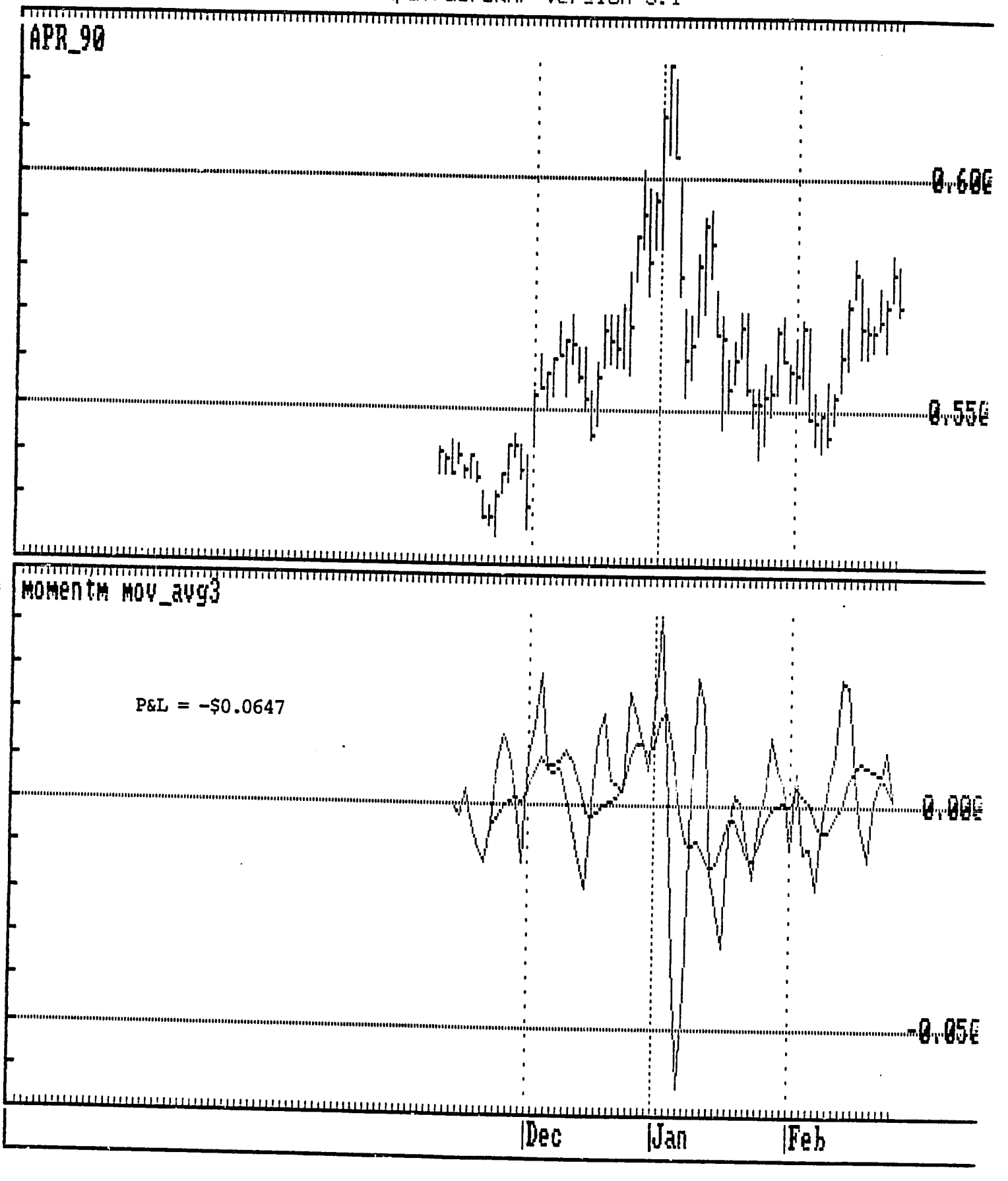
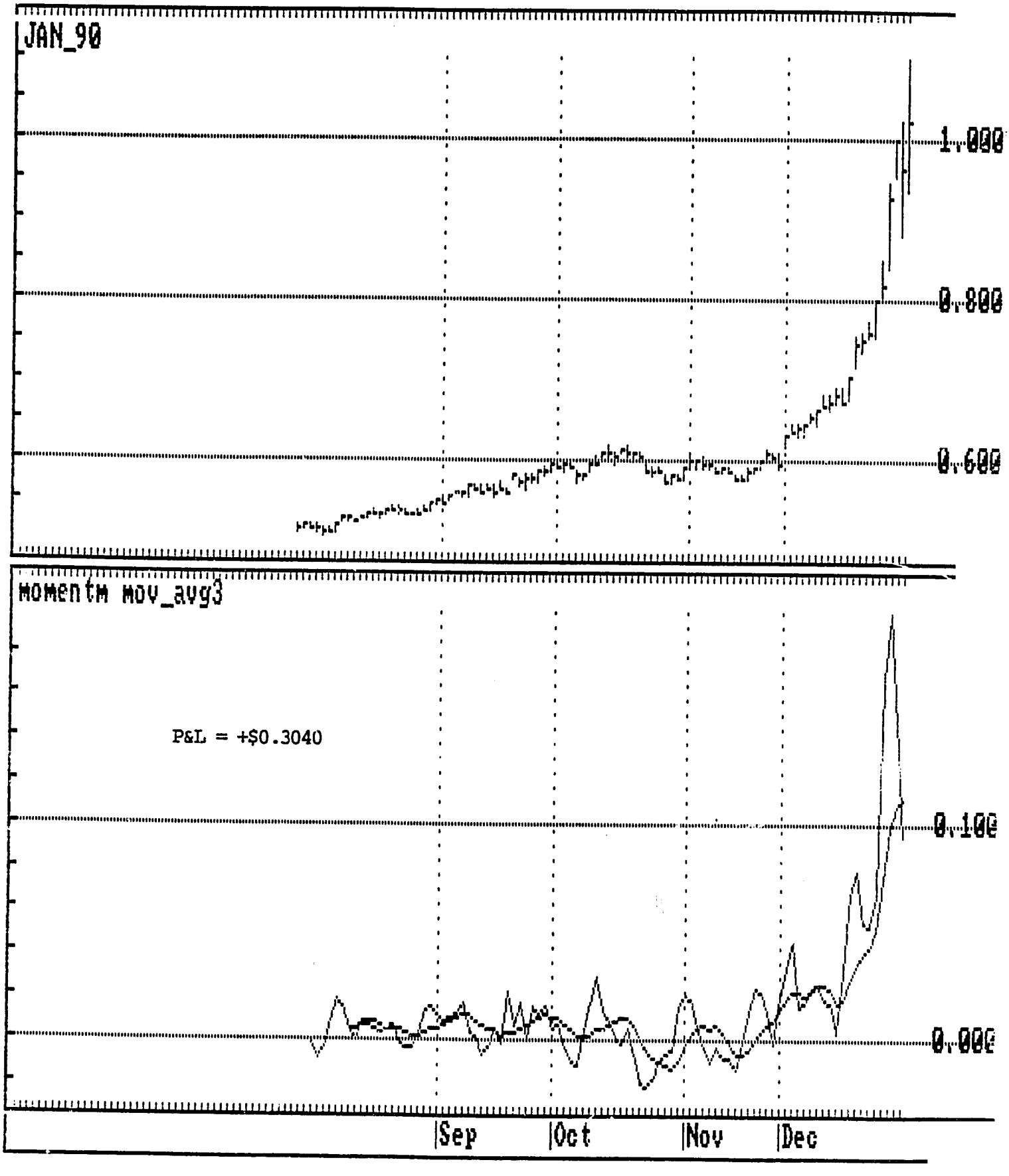
October 1989 NYMEX Unleaded Gasoline Contract: 1 vs. 5 Day Moving Average
CompuTrac/SNAP version 3.1



April 1990 NYMEX Heating Oil Contract: 3 vs. 7 Day Momentum
CompuTrac/SNAP version 3.1



January 1989 NYMEX Heating Oil Contract: 3 vs 7 Day Momentum
CompuTrac/SNAP version 3.1



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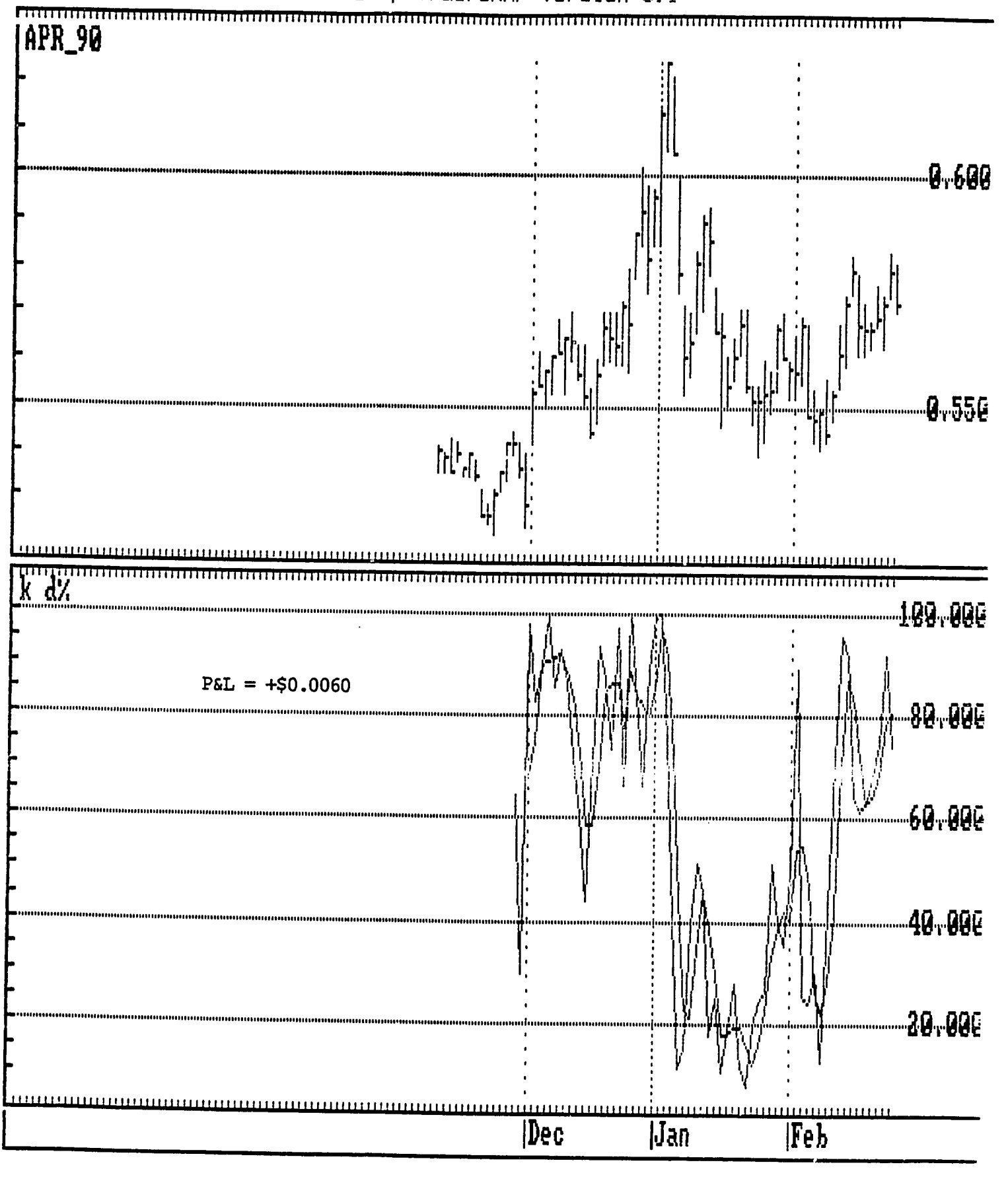
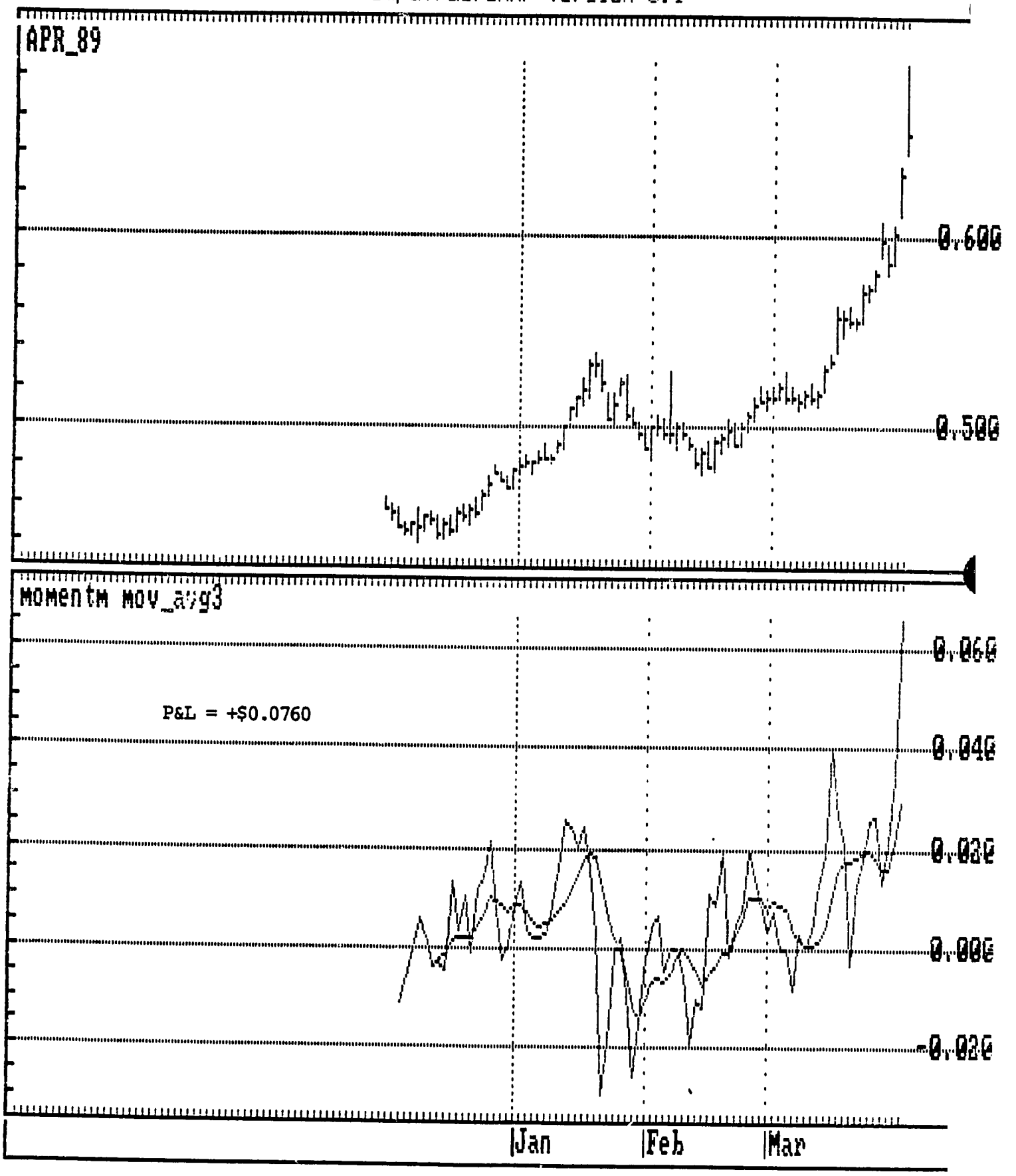
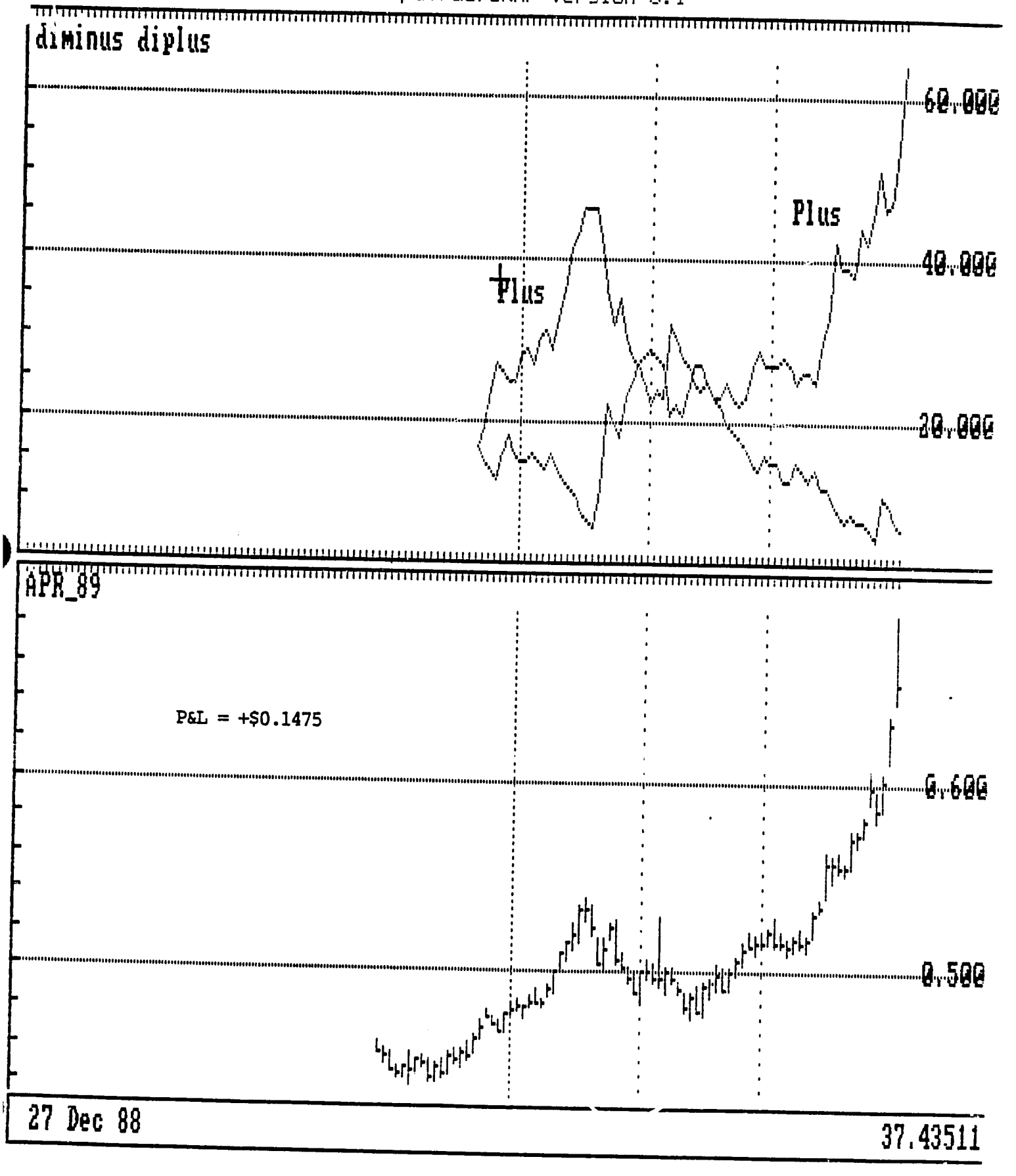
April 1990 NYMEX Heating Oil Contract: Stochastic 14 Day
CompuTrac/SNAP version 3.1



April 1989 NYMEX Unleaded Gasoline Contract: 3 vs 7 Day Momentum
CompuTrac/SNAP version 3.1



April 1989 NYMEX Unleaded Gasoline Contract: 14 Day Directional Movement
CompuTrac/SNAP version 3.1



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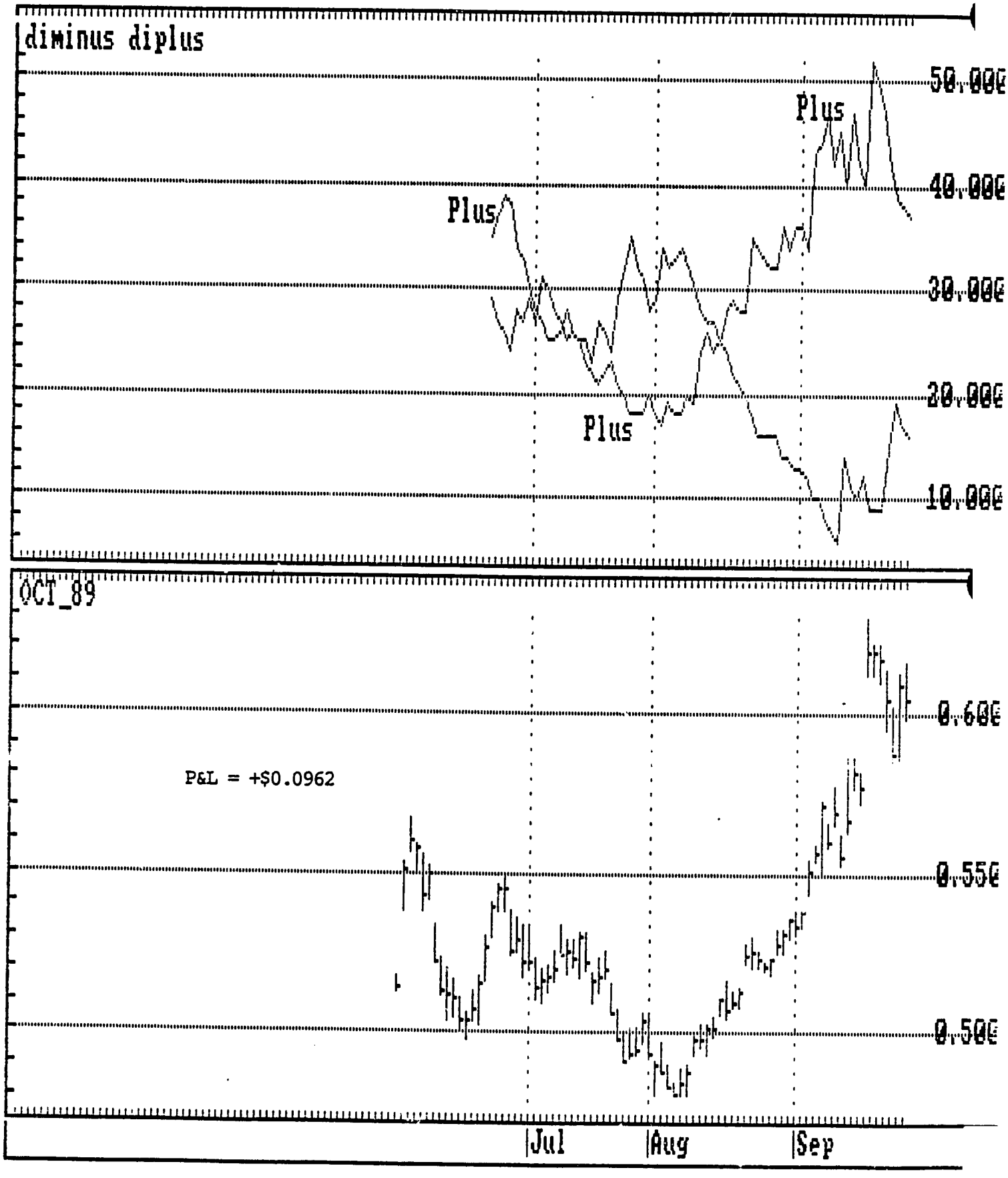
October 1989 NYMEX Unleaded Gasoline Contract: 14 Day Directional Movement
CompuTrac/SNAP version 3.1



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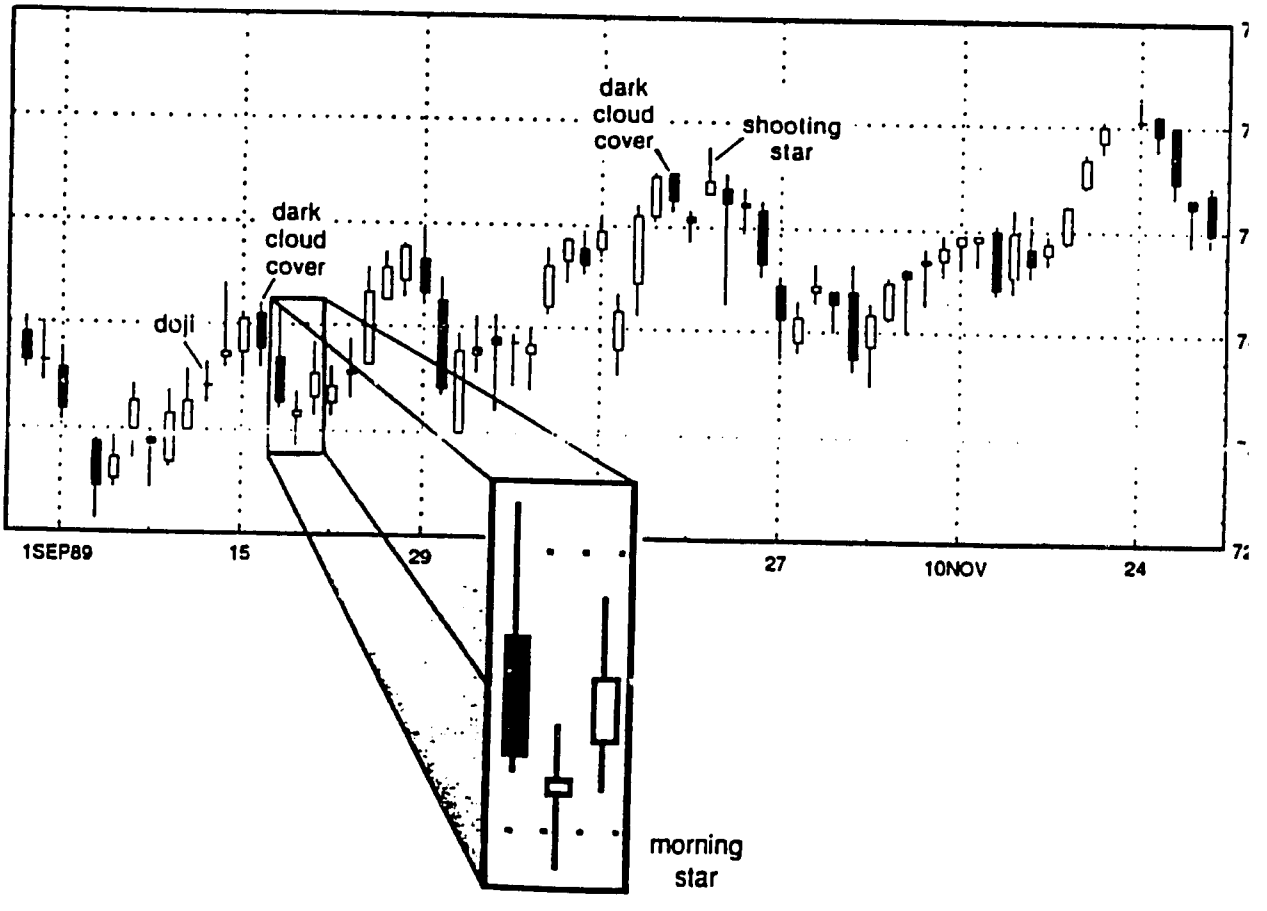
東洋の秘密

Introducing Japanese Candle Charts

(Secrets of The Orient)



Merrill Lynch

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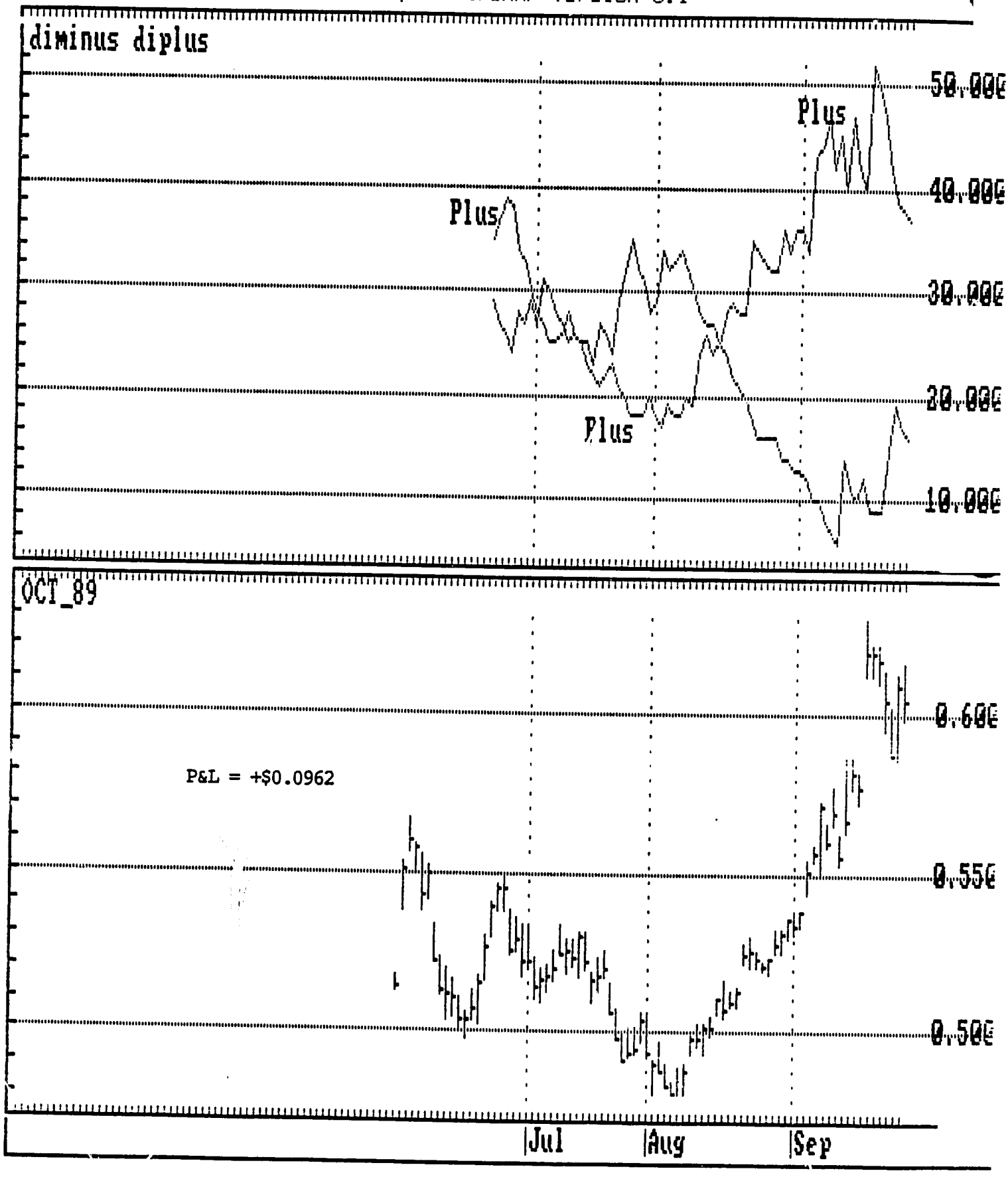
October 1989 NYMEX Unleaded Gasoline Contract: 14 Day Directional Moveme
CompuTrac/SNAP version 3.1



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Introduction

Traditional methods of chart analysis use bar or point and figure charts. Yet over 100 years before these methods originated, the Japanese were using their own style of technical analysis in the rice market. This style evolved into the candlestick techniques currently used in Japan.

In the 1600s the Japanese were trading forward contracts in rice — called "empty rice", because they were trading rice that wasn't there. Rice was not only Japan's main staple, but it underpinned the economy. Samurai warriors' salaries were rice stipends. These stipends were derived by a rice tax levied by the government. From the peasant on up, the price of rice was crucial.

Although they were not the first to trade forward contracts (the Dutch were in the 1500s), the Japanese were the first to use technical analysis. It's believed Japanese price charts originated around 1750. Some patterns used by the Japanese are similar to our own, but were discovered much earlier. For example, the equivalent of our head and shoulders formation was predated by the Japanese three Buddha pattern. This was related to the Buddhist temples in which there is a large central Buddha with saints on both sides — a perfect analogy to a head and shoulders.

With their extended historical foundation, Japanese candlestick patterns can offer us new insights. Their picturesque names also make them fun to use. Expressions such as "dark cloud covers," "morning stars," and "windows" abound.

These techniques offer a wide spectrum of applications:

- Candlestick charts are a useful stand alone tool. They can also be merged with other technical tools to create a synergy of techniques.

- Knowing how the Japanese analyze markets provides valuable information given the extent of their participation in the U.S. financial markets.

- Certain Japanese candlestick combinations may imply a period of consolidation (therefore a decline in volatility), others hint of a forceful price move (thus a rise in volatility). They give deeper insight into market conditions that could provide benefits to option traders.

The Japanese method of plotting is called candlesticks because the daily lines resemble candles. The candlestick lines, alone and in combination, provide valuable assistance in trading. This report uses American names for the indicators. The "tsutsumi" line is a line that "engulfs" the prior day's price action. So this is called an engulfing line. The Japanese names are in parenthesis. Indicators are illustrated and shown in chart examples. All charts are courtesy of Bloomberg Ltd.

The patterns illustrated are representative examples. The lines don't have to look exactly as they do in the illustrations to provide a valid signal. And, as with all charting methods, formations are somewhat subject to the interpretation of the user.

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Steve Nison - V.P. Senior Technical Analyst, Merrill Lynch Futures Research.

Steve Nison has been analyzing the futures markets for 17 years. He has an M.B.A. in Finance and Investments from Baruch College in New York. He is a Chartered Market Technician and an officer of the Board of the Market Technicians Association.

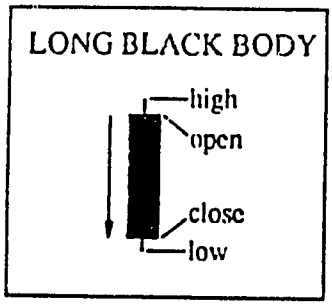
His articles and his recently published book "Japanese Candlestick Charting Techniques" have created a grounswell of interest on the subject around the world. Steve has spoken before many professional organizations, including the World Bank in Washington. He has appeared on TV and articles have been written about him and candles in the Wall Street Journal, Institutional Investor, and the L.A. Times. His appearance on FNN's "Guru Review" resulted in the most calls FNN had ever received.

Steve is credited with starting the candlestick revolution now underway and is an acknowledged Western Authority on the subject.

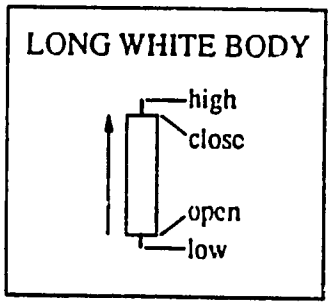
Reading the Candlestick Lines

The daily candlestick line illustrates the market high, low, open and close. The thick part of the candlestick is called the "real body". It represents the range between the open and close. When the real body is black (i.e., filled in), as in the Long Black Body below, it means the close was lower than the open. If, as in the Long White Body below, the real body is white (i.e., empty), it means the close was higher than the open.

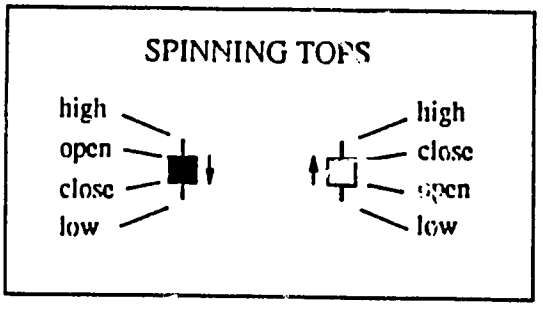
The thin lines above and below the real body are called the "shadows" and they represent the high and low of the day. The Long Black Body shows a close near the low of the day. The Long White Body shows a close near the high of the day. The relationship between the day's open, high, low and close change the look of the daily candlestick.



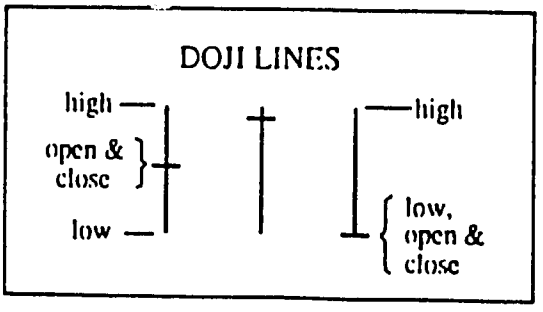
Long Black Body. This represents a bearish period in the market. Prices experienced a wide range, and the market opened near the high and closed near the low of the period.



Long White Body. This is the opposite of a long black body, and represents a bullish period in the market. Again, prices experienced a wide range, however, the market opened near the low and closed near the high of the trading period.



Spinning Tops. These are small real bodies, and can be either black or white. The small body represents a relatively tight range between the open and close for the period. In a trading range environment, spinning tops are neutral, but they may become important as parts of other chart patterns. (See stars and harami later in this report.)



Doji Lines. These illustrate periods where the opening and closing prices for the period are the same. The length of the shadows can vary. As you'll see throughout this report, doji lines are important in a variety of patterns.

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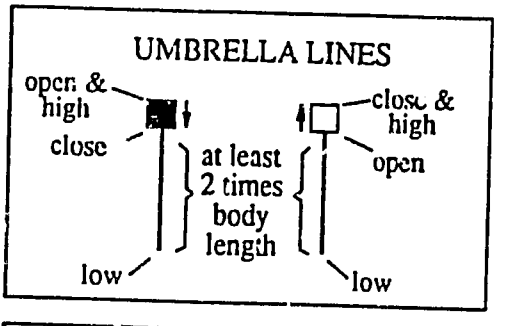
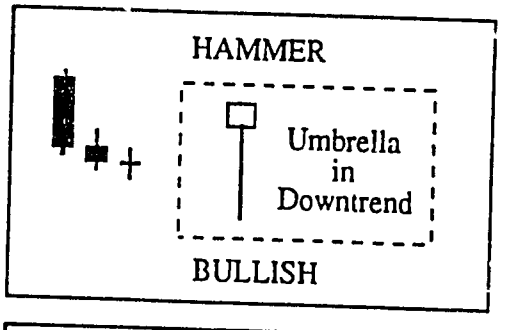
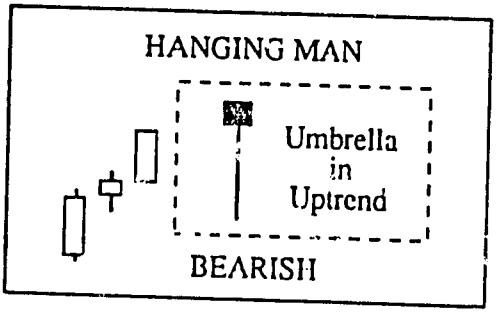
Reversal Indicators







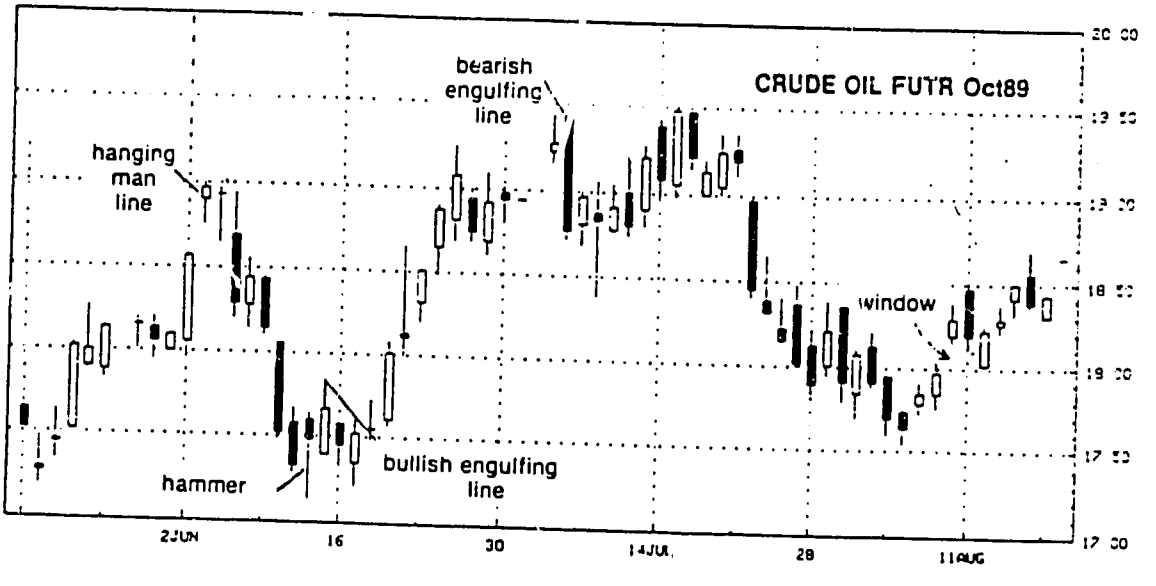
Hammers and Hanging Man Lines (Takuri and Kubitsuri)

Umbrellas can be either bullish or bearish depending on where they appear in a trend. If they occur during a downtrend, they are called **hammers** and are bullish, as in "the market is 'hammering out' a base." If an umbrella appears in an uptrend it's bearish, and is referred to as a **hanging man.**

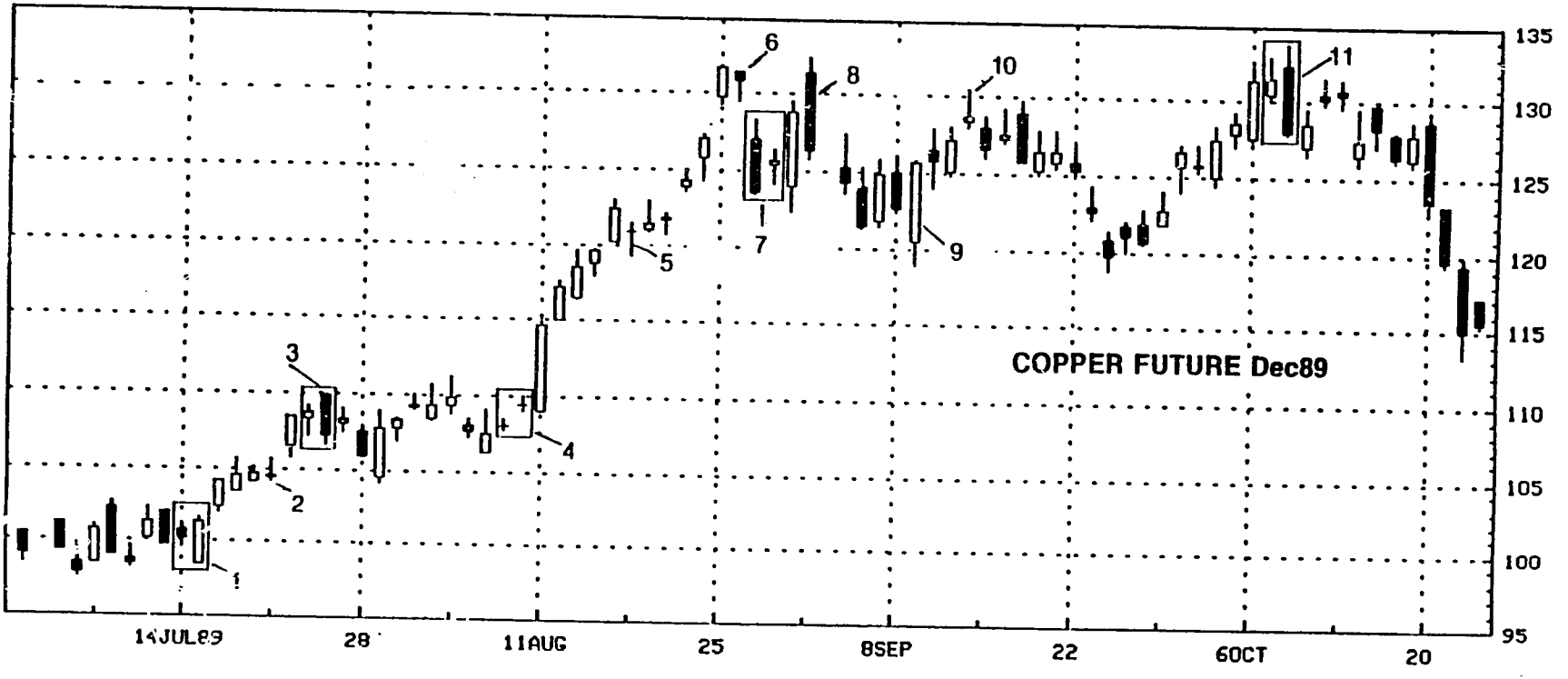
Umbrella lines can be recognized by two criteria: 1) a real body at the upper end of the entire trading range, with little or no upper shadow, and 2) a lower shadow that is at least twice the length of the real body. The color of the real body isn't important.

Hammers are excellent signals of a market at or near its bottom. At times, they are also important at the lower end of a congestion band.

The ominous name of the hanging man line (derived because it looks like a hanging man with dangling legs) hints at its bearish nature. If one appears at the top of a prolonged uptrend, it's usually time to vacate long positions.



In early June, a hanging man line signaled a reversal. Almost two weeks later, a hammer indicated the market was bottoming. The hammer's lower shadow was a low in the sell-off.


COPPER FUTURE Dec89
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11AUG
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6OCT
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105
100
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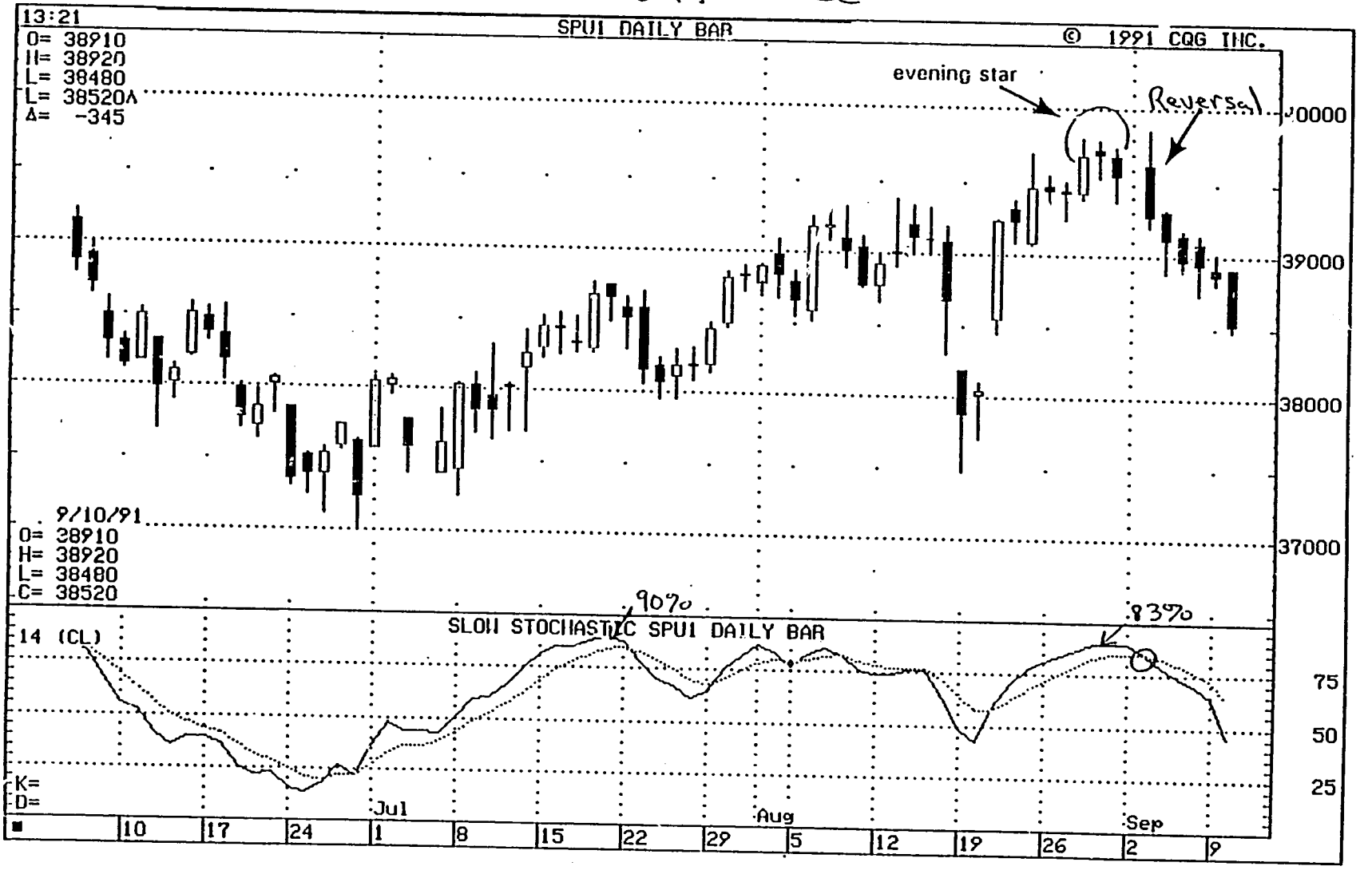
11

Copper Candle Chart Indicators:

1. Bullish engulfing line. Although more important after a downtrend, this line also should be respected during a lateral trading band.
2. A doji line at new highs could mean a top. However, the next day's bullish line didn't confirm this view. Notice how this doji line then became support on the selloff the following week.
3. Bearish engulfing line.
4. Double doji —expect a big price move.
5. A doji line that became a support area.
6. A hanging man signals a top.
7. The harami pattern shows the large down day was followed by a day of uncertainty. The downtrend lacked followthrough. Prognosis: For now a downleg is unlikely.
8. Dark cloud cover giving another hint of a top.
9. A bullish engulfing line.
10. A bearish shooting star.
11. A bearish engulfing line called the top of this market.

Confluence



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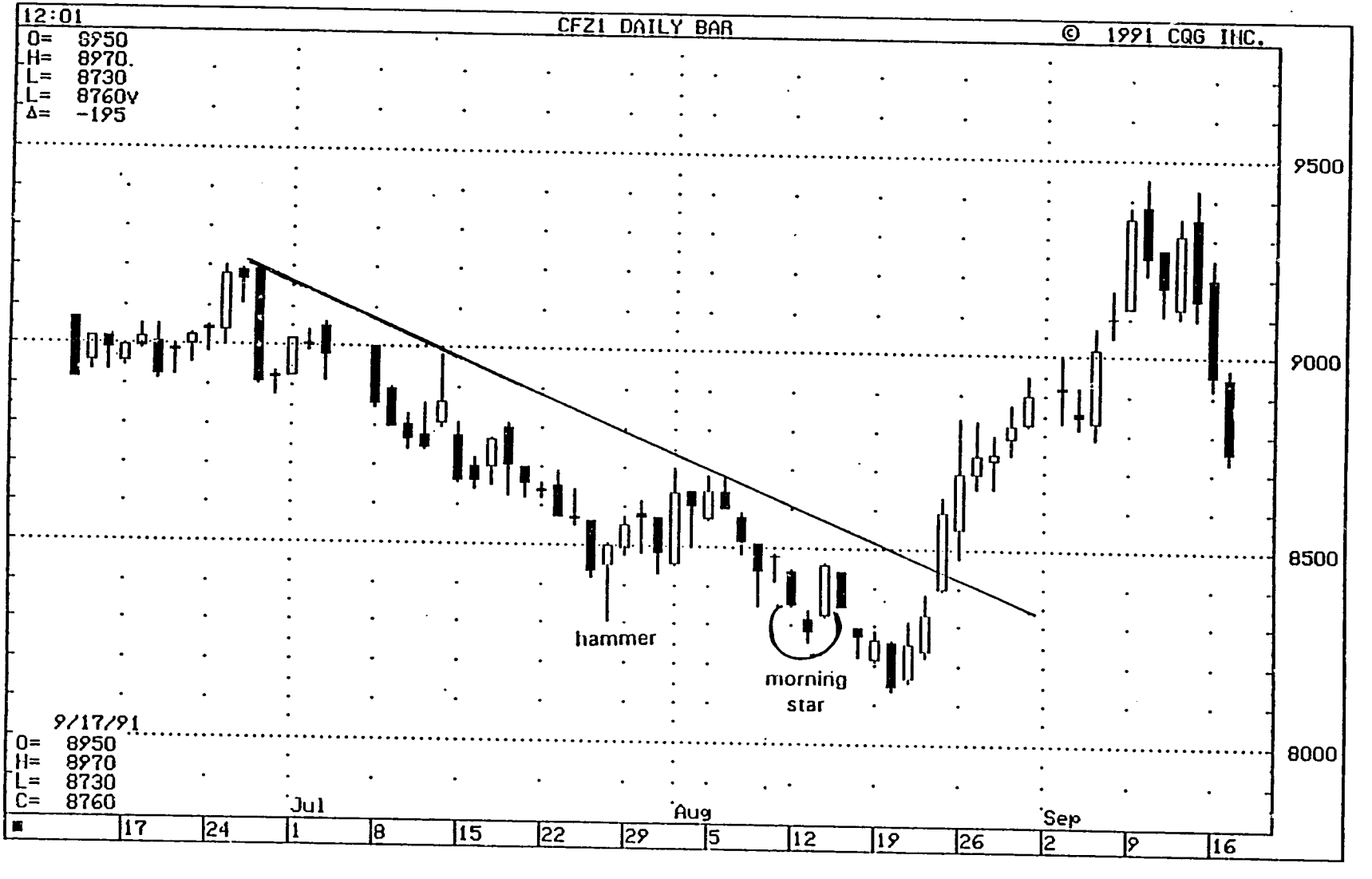
Remember the Overall Technical Picture!



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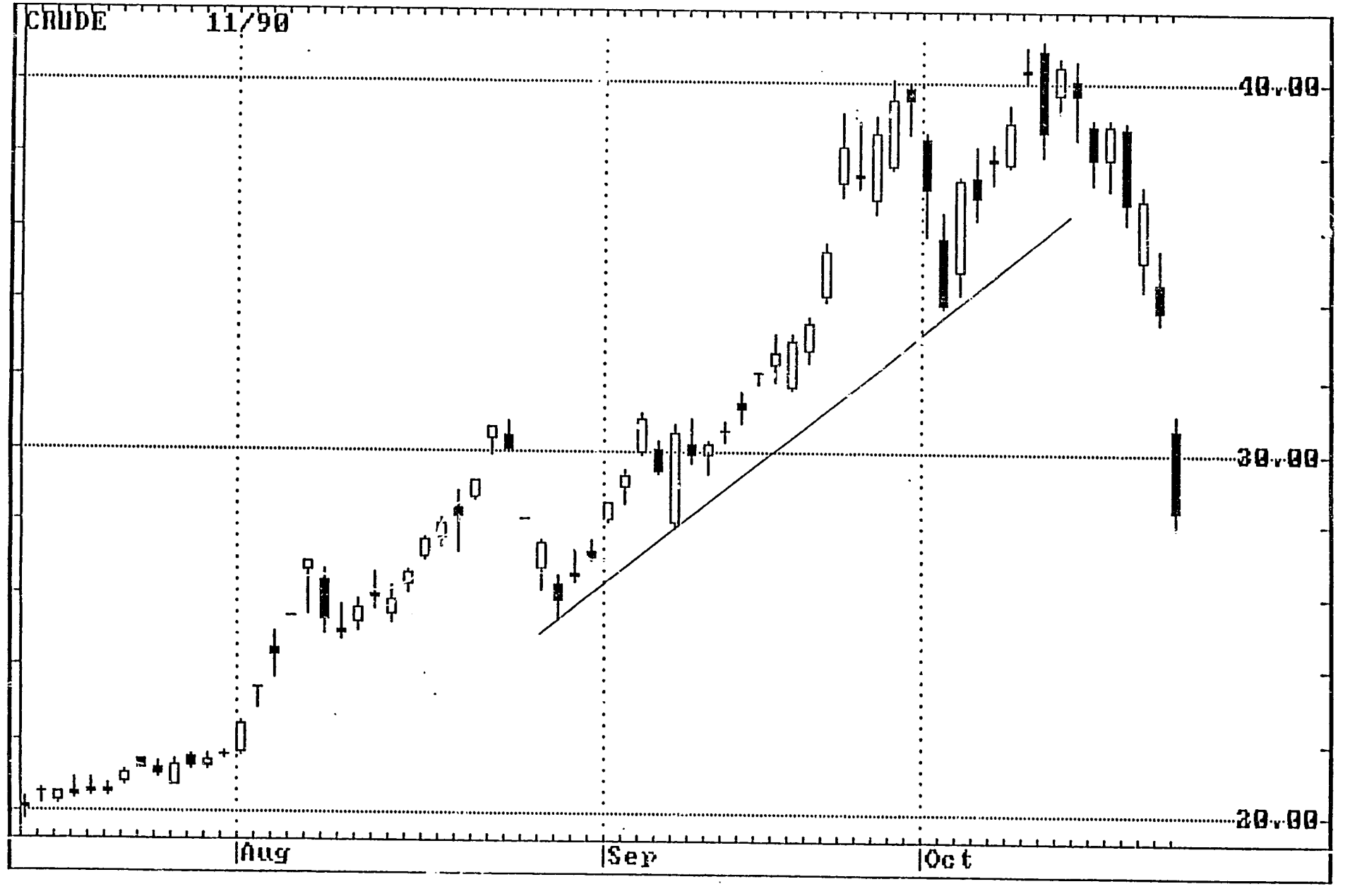

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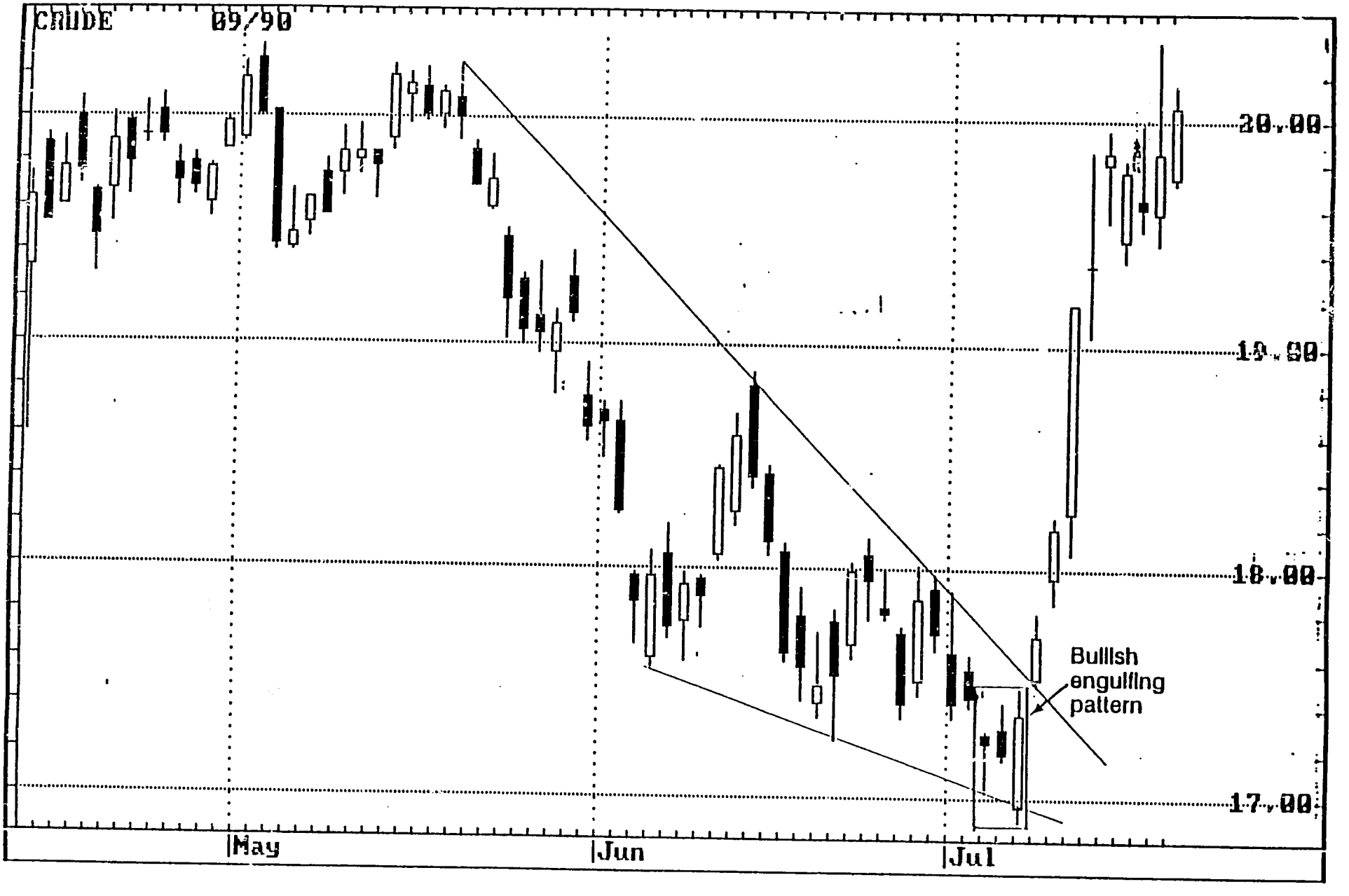
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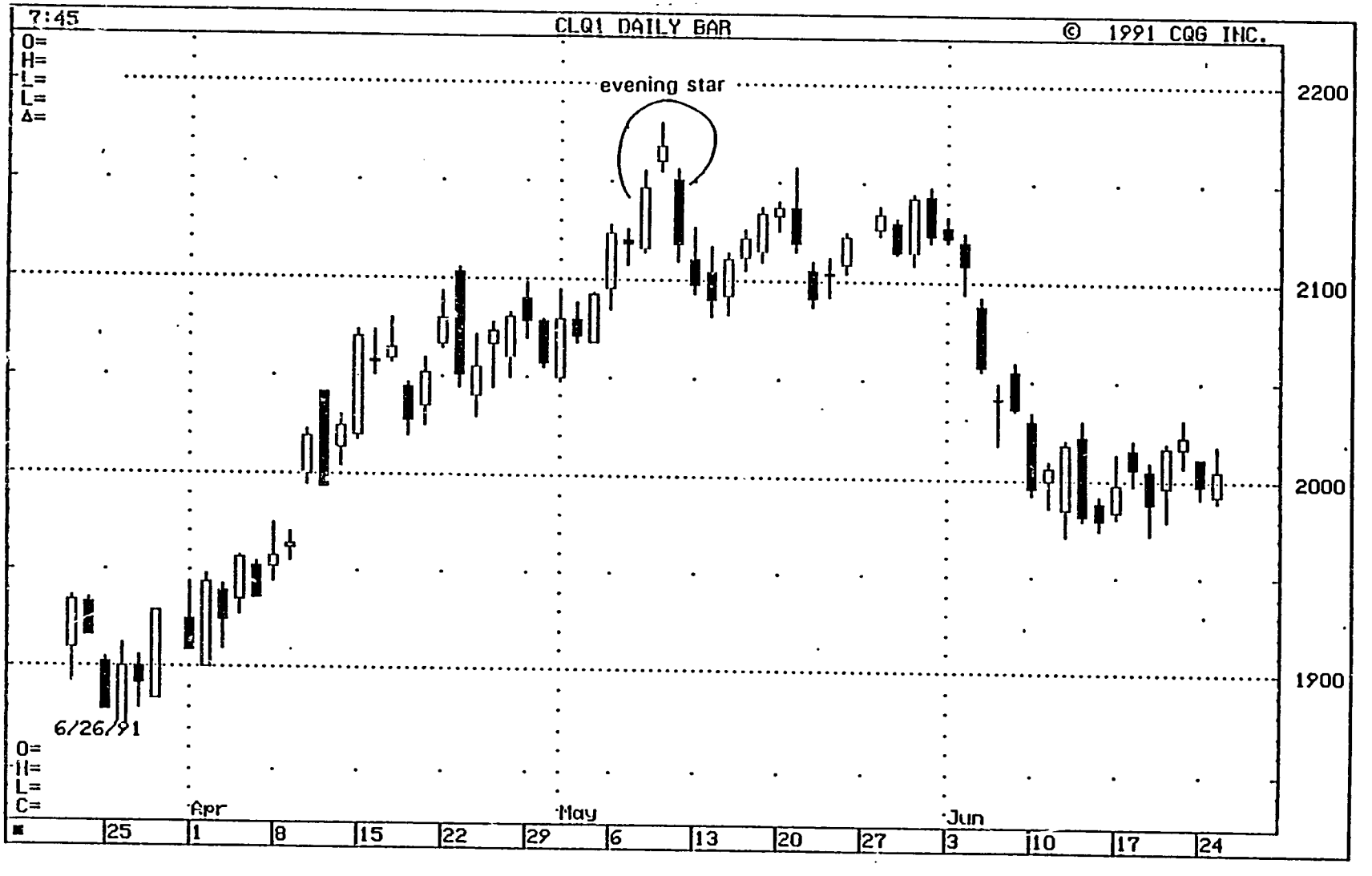

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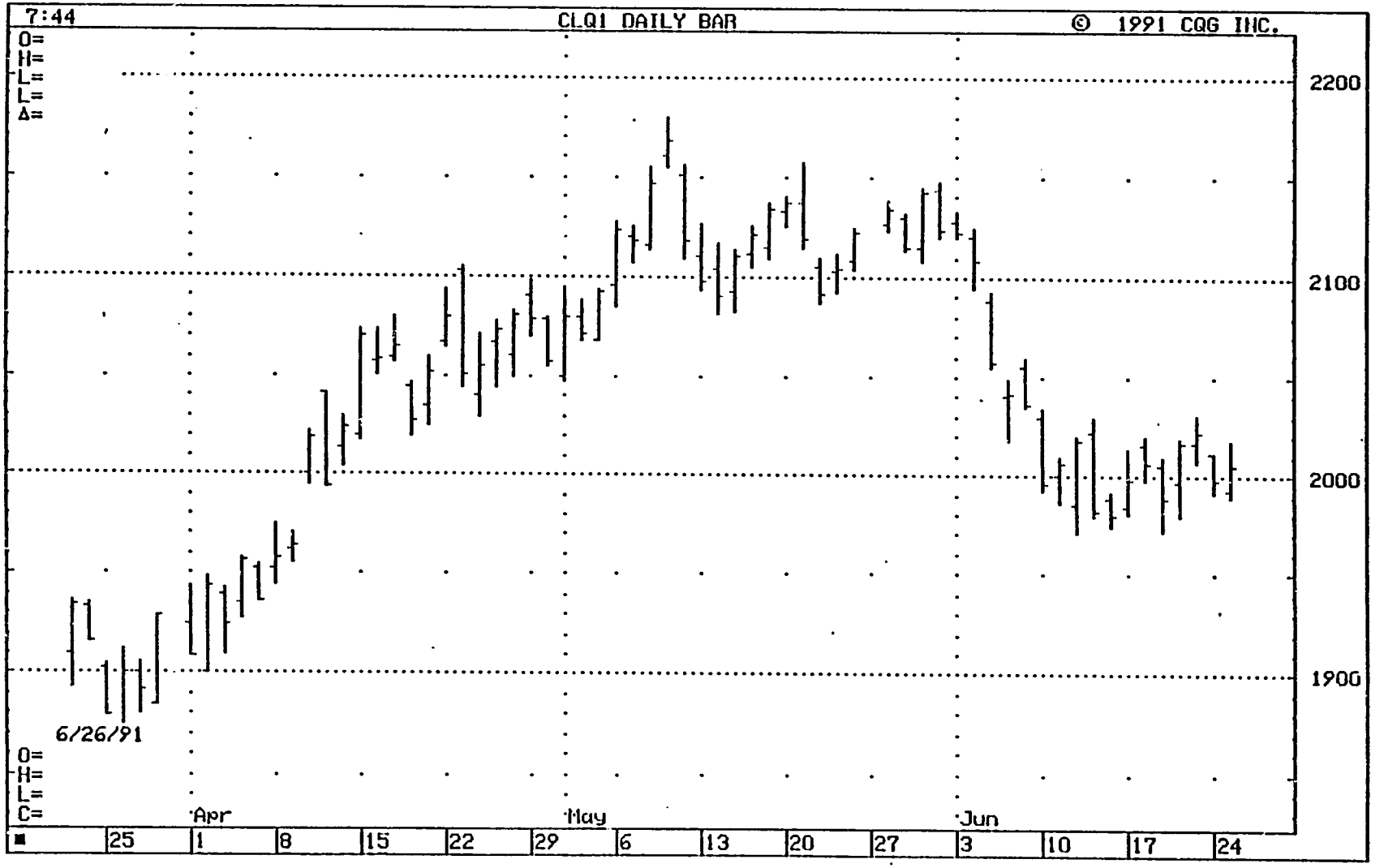

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Section 18

Crack Spread Trading System

GASOIL VS. CRUDE OIL HEDGE EXAMPLES

ALT. 1...DO NOTHING...GET "MARKET" CRACK SPREAD AT TIME OF PRODUCT SALE

ALT. 2...SINGLE LEG ONLY: SELL GASOIL IN MONTH t+1 WHEN CRUDE HAS BEEN PRICED AT DELIVERY OFF BRENT DATED

PERIOD:	1	2	3	4	5	6	AVG.
GASOIL (t+1) PRICE:							
@ HEDGE DATE	22.67	22.93	24.00	22.58	22.48	22.59	22.88
@ SETTLE DATE	22.93	24.00	22.58	22.22	22.59	22.75	22.85
PROFIT/(LOSS) FOR STRATEGY 2	-0.26	-1.07	1.42	0.36	-0.11	-0.16	0.03
BRENT DATED @ t	17.94	18.93	19.46	19.09	18.77	18.02	18.70
CRACK SPREAD @ MARKET	4.99	5.07	3.12	3.13	3.82	4.73	4.14
CRACK SPREAD HEDGED	4.73	4.00	4.54	3.49	3.71	4.57	4.17

ALT. 3... COMBINED CRACK SPREAD: BUY BRENT CRUDE FUTURES IN MO. t, AND SELL GASOIL IN t+1 SIMULTANEOUSLY
EXECUTE PRIOR TO DELIVERY OF CRUDE

PERIOD:	1	2	3	4	5	6	AVG.
GASOIL (t+1) PRICE:							
@ HEDGE DATE	25.17	22.98	22.91	24	21.94	22.48	23.25
@ SETTLE DATE	22.93	24	22.5	22.22	22.59	22.75	22.83
PROFIT/(LOSS) FOR PRODUCT LEG	2.24	-1.02	0.41	1.78	-0.65	-0.27	0.42
BRENT NEAR FORWARD							
@ HEDGE DATE	18.50	16.57	17.27	18.37	18.14	17.78	17.77
@ SETTLE DATE (I.E., BRENT DATED PRICE)	16.84	17.27	18.37	18.14	17.78	18.06	17.74
PROFIT/(LOSS) ON CRUDE FOR STRATEGY 3	-1.66	0.70	1.10	-0.23	-0.36	0.28	-0.03
COMBINED P & L (CRUDE + PRODUCT) FOR STRATEGY 3	0.58	-0.32	1.51	1.55	-1.01	0.01	0.39
ALT. 3 NET CRACK SPREAD VS.	5.57	4.75	4.63	4.68	2.81	4.74	4.53
DO NOTHING	4.99	5.07	3.12	3.13	3.82	4.73	4.14

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ALT. 4

LOCK CRUDE - PRODUCT SPREAD SIX MONTHS IN ADVANCE DIRECTLY ON IPE FUTURES OR THROUGH SWAP MARKET

SWAP OR FORWARD HEDGE		MARKET AVG.
AVG. GASOIL PRICE =	$25.00	$22.85
AVG. BRENT PRICE =	$18.71	$18.70
AVG. CRACK SPREAD =	$6.29	$4.15

....May be able to obtain a more favorable single six-month crack spread "over-the-counter" price if the crack spread is in sharp backwardation, enabling offeror/seller of crack spread to benefit from favorable time value cash flow since net payments on (higher) near-month spreads would likely be from the refiner to the swap market-maker.

Factors Affecting Choice of Crack Spread Hedging Strategies

(1) Nature of Crude Pricing Relative to Product Sales and Pricing (i.e., Netback, CIF Destination, FOB Source, Formula vs. Fixed, Competition in Product Pricing at Wholesale and Retail),

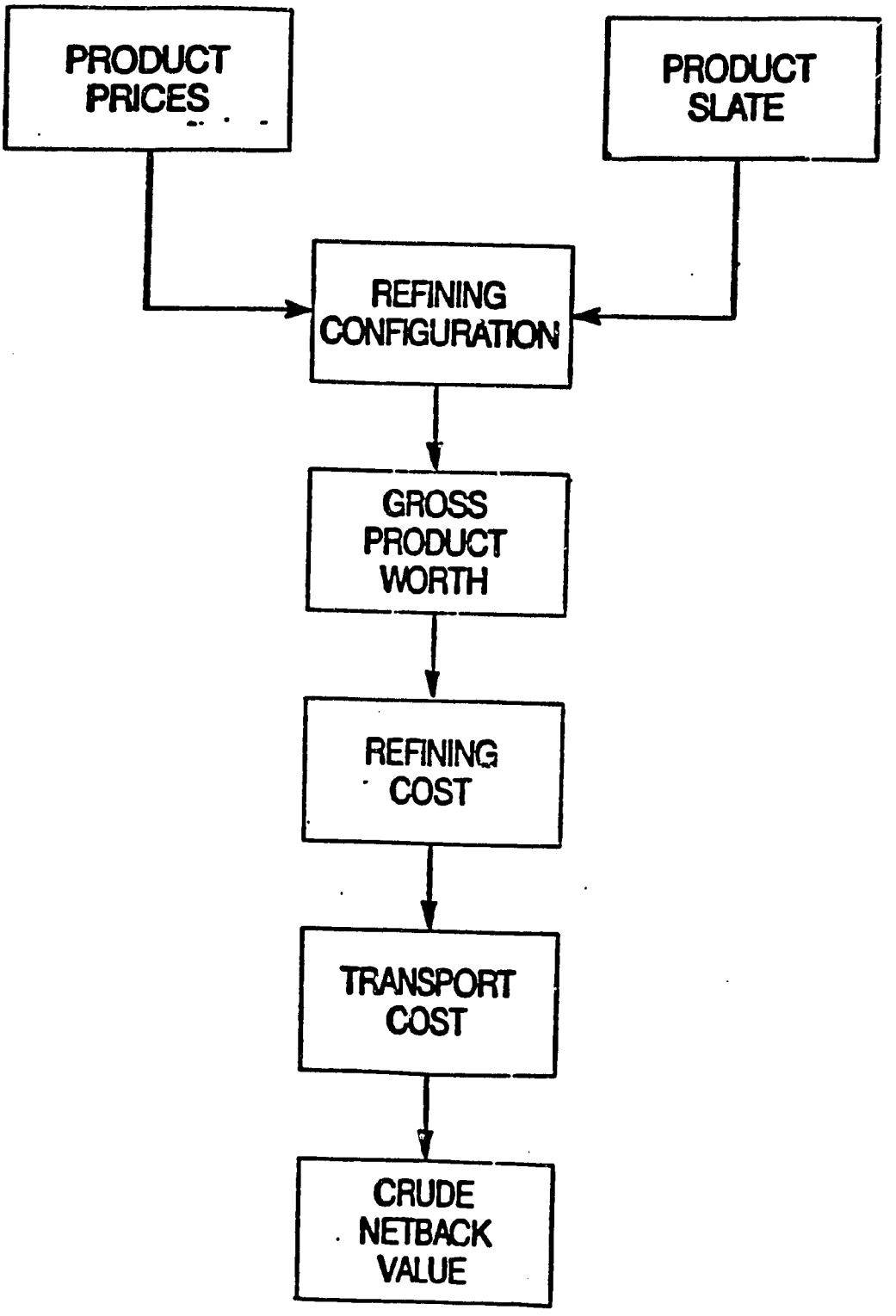
(2) Degree of Price and Refinery Margin Basis Risk... with regard to both crude and product pricing, yield mix, timing, quality and other factors affecting crude relationship between real refining margins and the paper market "crack" spreads,

(3) Management's propensity, trading skill and incremental cost associated with directly hedging vs. relying on OTC market-makers.

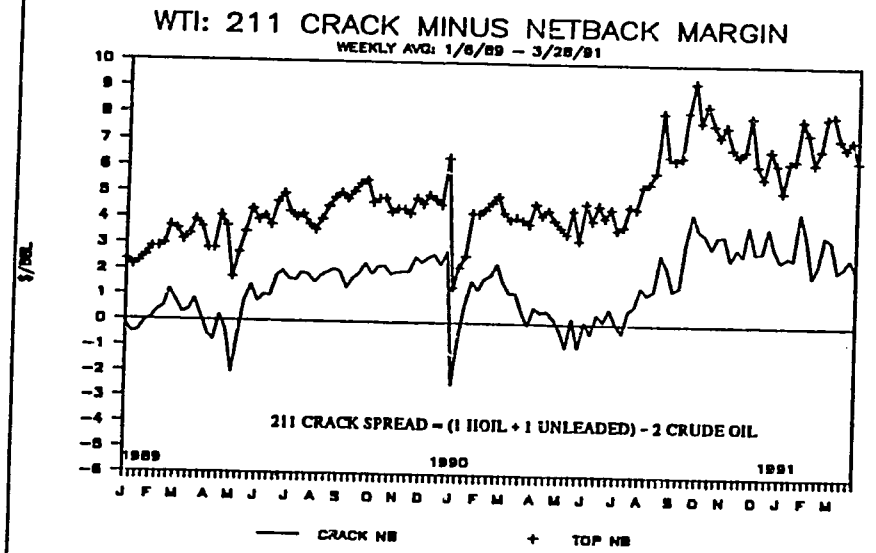
(4) Time spread pattern of the crack spread: If in backwardation, cash flow is initially away from refiner/buyer; If in contango, cash flow to refiner/buyer, functioning like a loan.

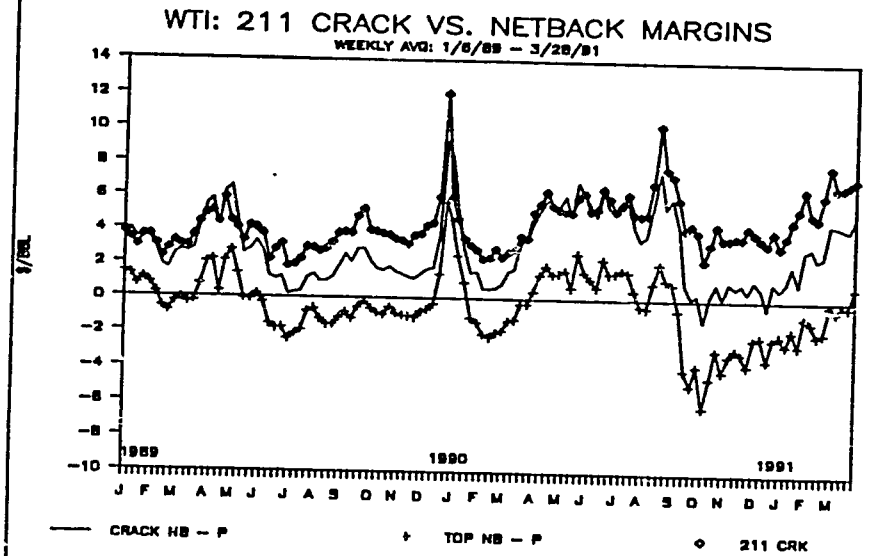
(5) Others....

NETBACK VALUE DETERMINATION



IV C: WTI NETBACK MARGIN VS. 211 CRACK SPREAD





211 CRACK MINUS WTI NETBACK MARGIN

	MAX	MIN	AVG	STD
CRACKING				
1/89-3/91	4.42	-2.42	1.48	1.35
LAST YEAR	4.42	-0.90	1.89	1.48
LAST MONTH	2.68	2.20	2.37	0.19
NON-DISRUPT*	3.38	-2.42	1.00	1.14
DISRUPTION**	4.42	1.19	2.86	0.87
1/91-2/91	4.42	1.97	3.00	0.74
TOPPING				
1/89-3/91	9.33	1.38	4.90	1.65
LAST YEAR	9.33	3.29	6.05	1.57
LAST MONTH	7.28	6.42	6.97	0.34
NON-DISRUPT*	8.15	1.38	4.18	1.14
DISRUPTION**	9.33	5.25	6.99	1.00
1/91-2/91	8.07	5.25	6.86	0.89

* = 1/89 - 7/90 & 3/91 ** = 8/90 - 2/91

- 211 CRACK MINUS NETBACK MARGIN SPREAD INDICATES HOW WELL GROSS PAPER REFINING MARGINS TRACK REAL GROSS MARGINS ACCOUNTING FOR THE FULL BARREL.
- INCREASE IN CRACK-NETBACK SPREAD FOLLOWING IRAQI INVASION IMPLIES THAT GASOLINE AND HEATING OIL PRICES ROSE PROPORTIONATELY MORE THAN OTHER PRODUCTS.

CRACK SPREAD TRADING SYSTEMS

(Overview)

- Crack spreads function as surrogate netback value indicators, and allow refining profitability to be "locked in".

- Crack Spreads, therefore, are the price vs. value relationship between anticipated refined product prices and crude oil prices, or laid-in costs.

- Depending on the timing of the crude oil purchase, and its pricing relative to the timing and terms of the product sale, a variety of permutations of the crack spread are conceivable:

  1) "Prompt or Nearby" Spread = Near Month Product - Near Month Crude Oil Price Appropriate for crude pricing on oil delivery vs. product pricing at origin.

  2) "Staggered" Spread = Forward product price (e.g., IPE Gasoil 2nd or 3rd Month) vs. Near Month Crude Oil, Appropriate for crude and product priced on delivery, with a 1-to-2 month lag between crude purchase and product sale.

  3) Pre-priced crude oil vs. forward product or its "forward" crack spread (e.g., last week's average Brent Dated vs. IPE Gasoil Near, 2nd, or 3rd month). Appropriate for hedging a known crude oil inventory cost, vs. a forward product price reflecting likely timing of product sale.

INTERPRETATION OF CRACK SPREADS

(Time Spread Features)

- The nearby crack spread provides an incremental indicator of the level and trend of refining margins.

- The "time spread" of the crack spread (e.g., month t+3 crack vs. month t+1 crack) provides an indication of the expected level and trend of the nearby crack. (see graph)

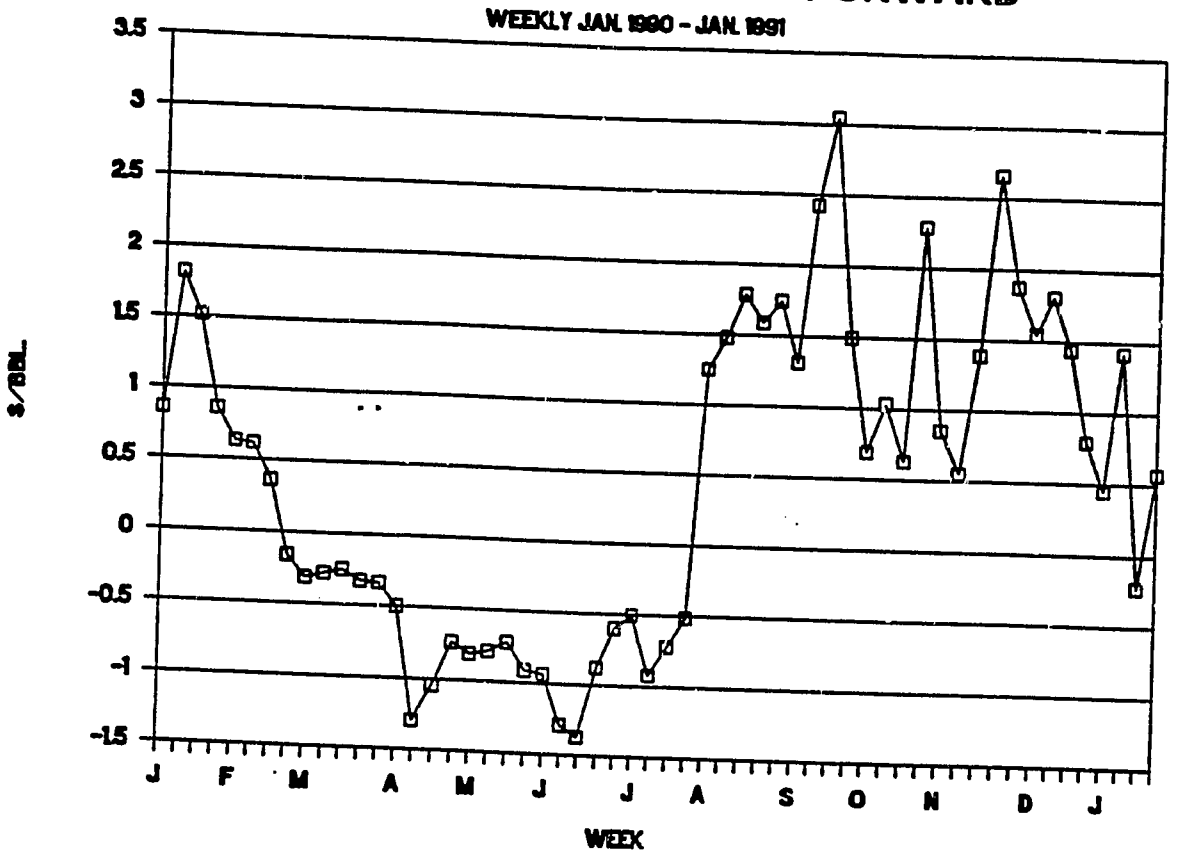
- The time spread of the crack spread reflects the sum of the time spread of products and the time-spread of crude oil:

  - When crude oil time spreads are in "backwardation" and products are in "contango", the time spread of the crack spread will be in contango (i.e., forward month higher then nearby month).

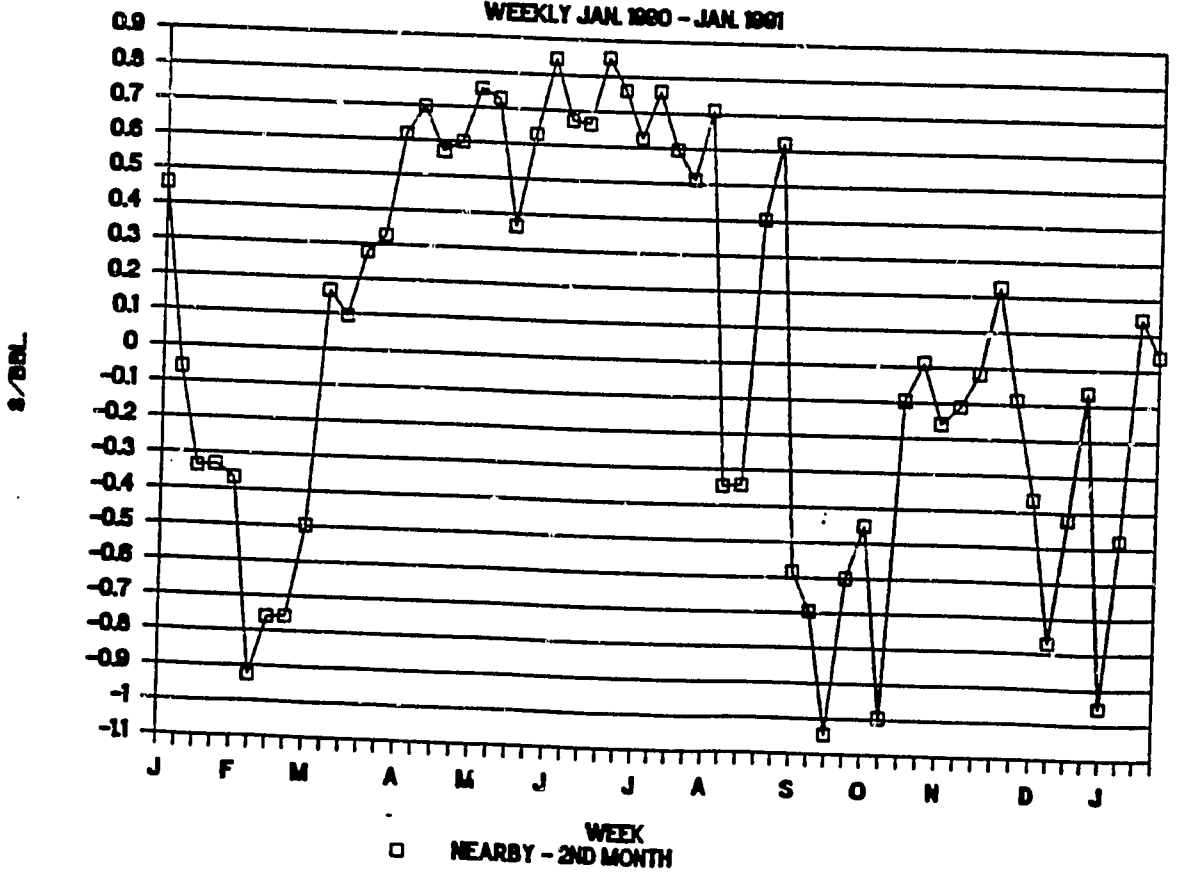
  - When crude oil time spreads are in contango, and product spreads in backwardation, the time spread of the crack spread will be in sharp backwardation.

  - Refiners should attempt to place their "crack spread" hedges in a manner which takes advantage of favorable movements in the time spread of the crack spread.

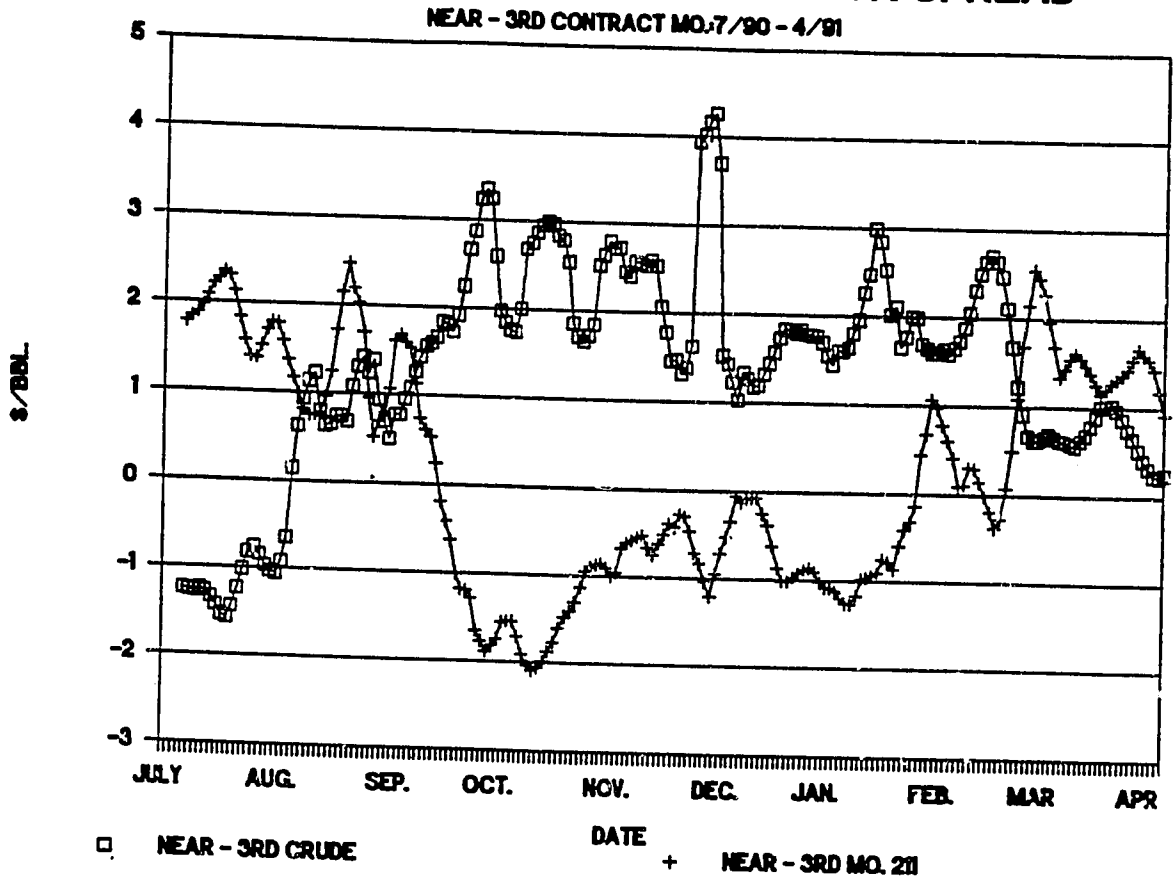
BRENT DATED - BRENT 2ND FORWARD



TIME SPREAD OF IPE 2/1/1 CRACK SPREAD:



WTI TIME VS. 2/1/1 NYMEX CRACK SPREAD



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Time vs. Crack Spread

- Strong backwardation (near > forward month price) in underlying crude oil market is normally associated with upward price pressure, as near-term price strength is discounted forward in time.

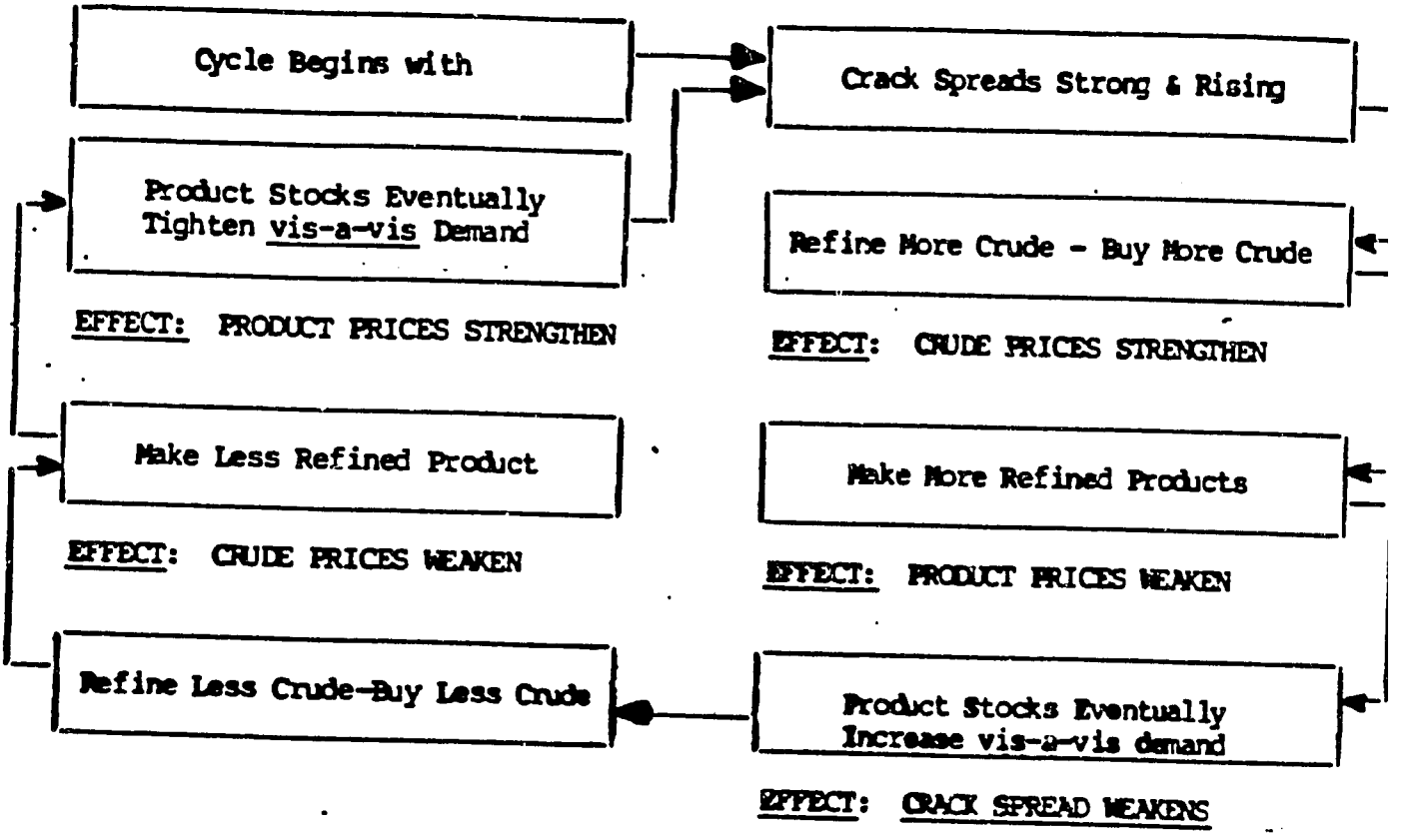
- By contrast, the time spread of crack spreads (near - forward month crack spreads) normally decreases with this prompt price pressure, as nearby refining margins are squeezed relative to forward months (when crude is cheaper).

- As the degree of backwardation declines in the crude market (i.e., the market moves to "contango" as nearby prices decline relative to forward month prices), and the time spread of the crack spread remains in contango, a good opportunity may exist to lock in forward month crack spreads, assuming these spreads are acceptably high.

  For example, favorable forward crack hedge opportunities may have occurred in most of August 1990, late November 1990, and in late January and February of 1991 on the NYMEX.

This crude vs. product price time dynamic should be a central focus of refinery hedge timing.

Illustration of Crack Spread's Relation to Refinery Cycle



EXTERNAL PRESSURES GENERATED BY:

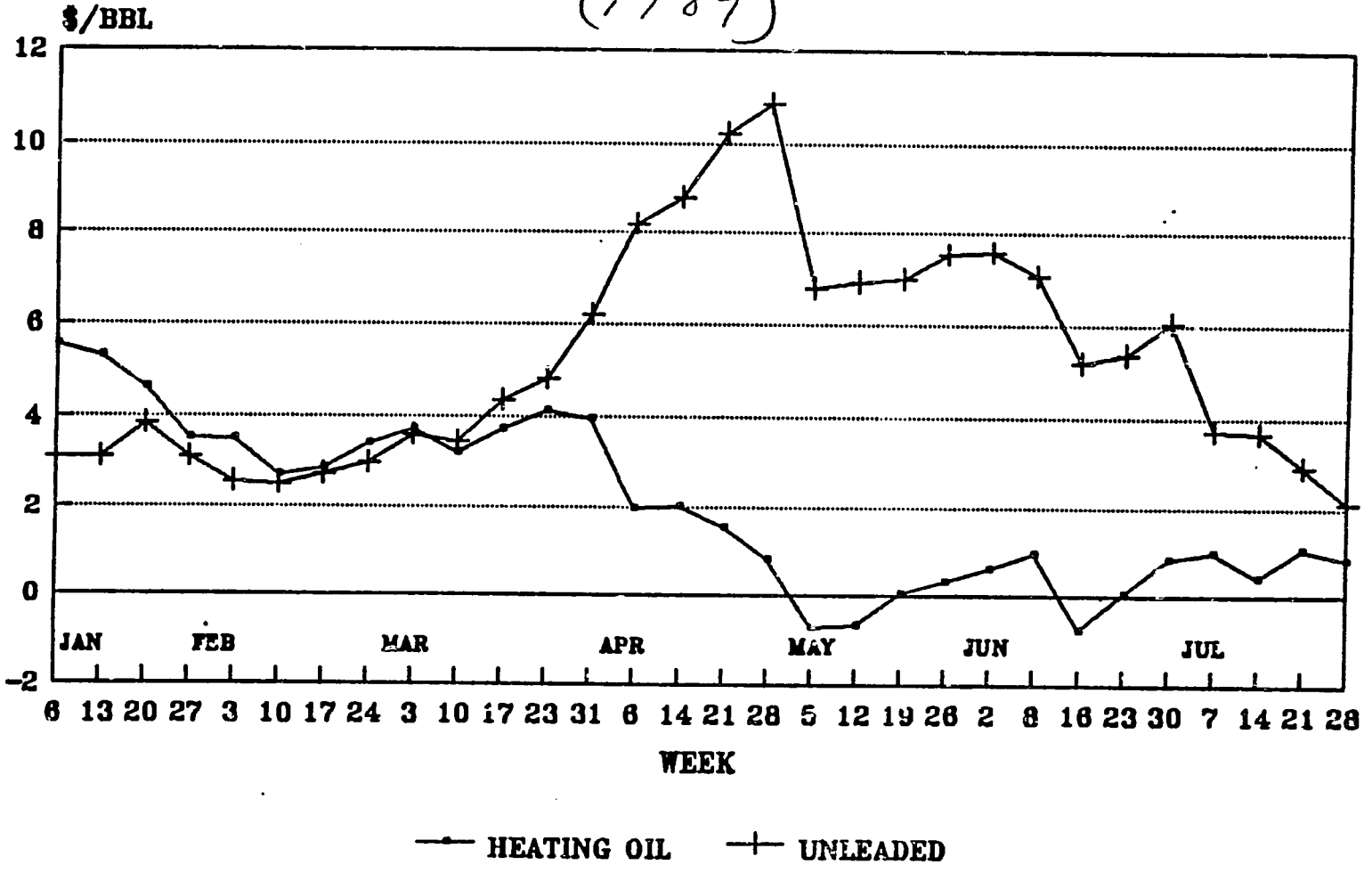
- OPEC Output Levels Change - raising or lowering price pressures, thereby increasing or decreasing incentives to buy more crude, create more product
- Shifting End-Use Product Demand - due to weather, economic, technological or regulatory change, thereby raising or lowering product demand, prices, refining margins, and, ultimately, demand for crude
- Sharp Change in Physical Capacity to economically produce, refine, transport oil, changing marginal cost, demand and production functions.

LEADING TO:

- Shifts in "Incremental" vs. "Average" Crude Costs and Product Prices which may distort the accuracy with which crack spreads mirror incremental refining economics (e.g., sharp domestic vs. foreign crude oil premium or discount).

LAST MONTH'S CRUDE MOVING AVERAGE COST VS. NEARBY PRODUCT

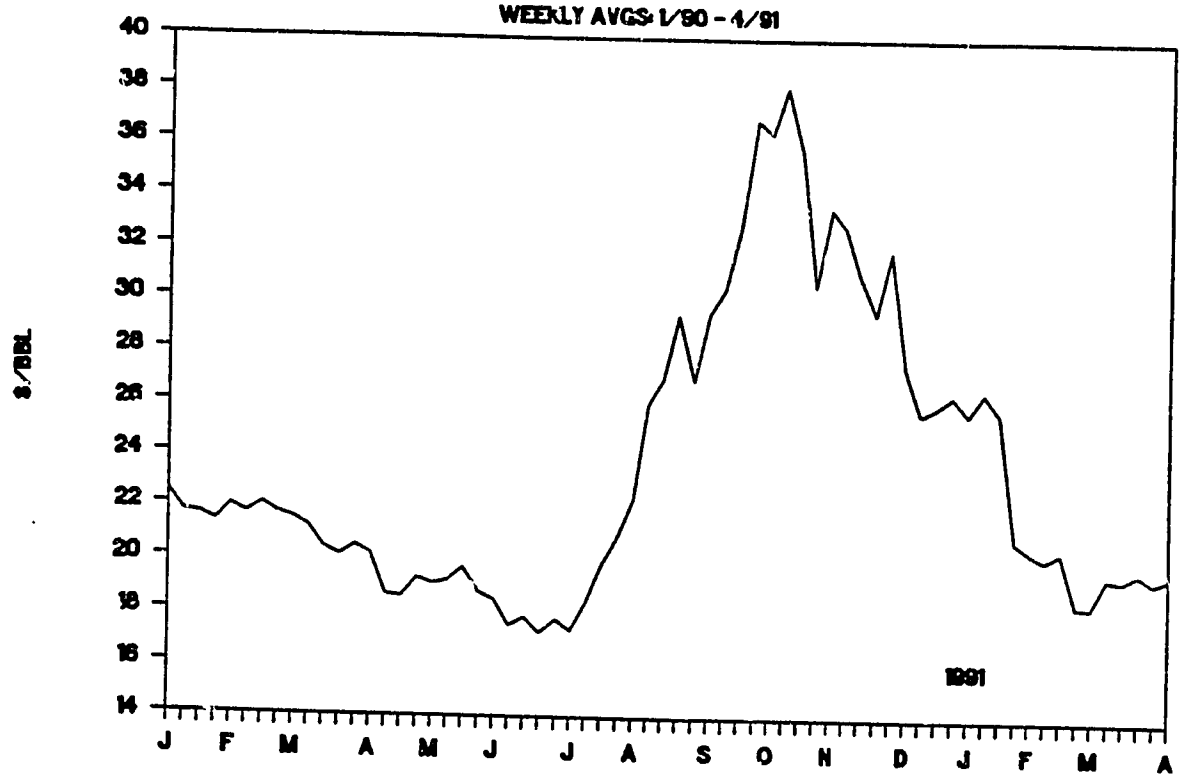
(1989)



The ENERGY FUTURES GROUP, Inc.

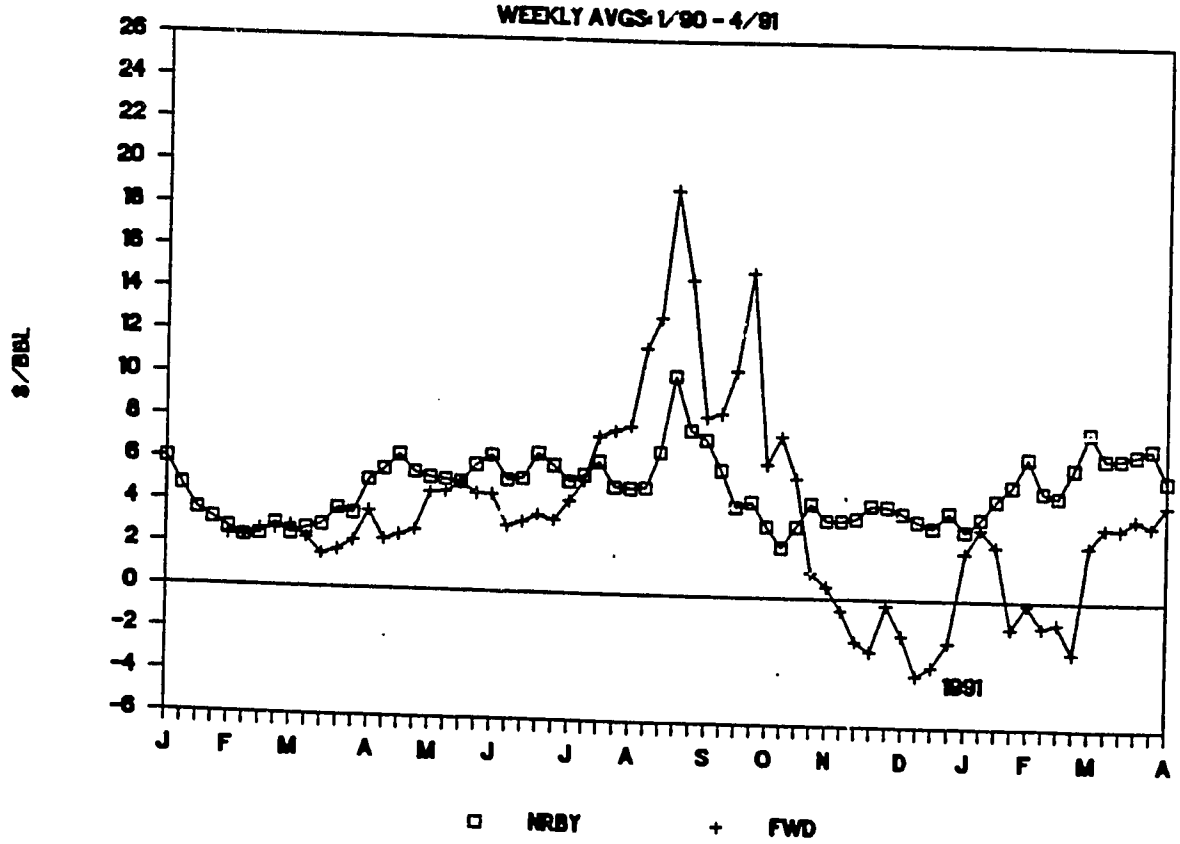
NYMEX WTI 2ND MONTH

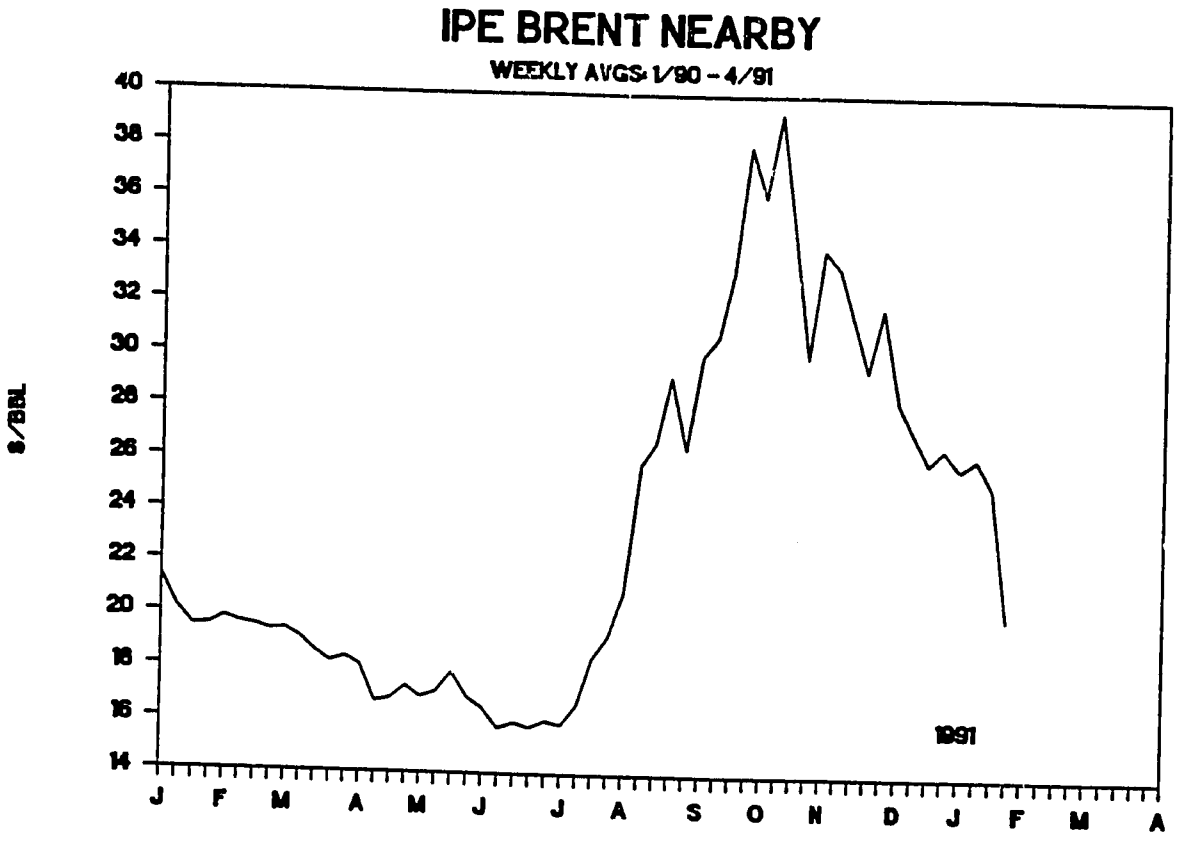
WEEKLY AVGS: 1/90 - 4/91

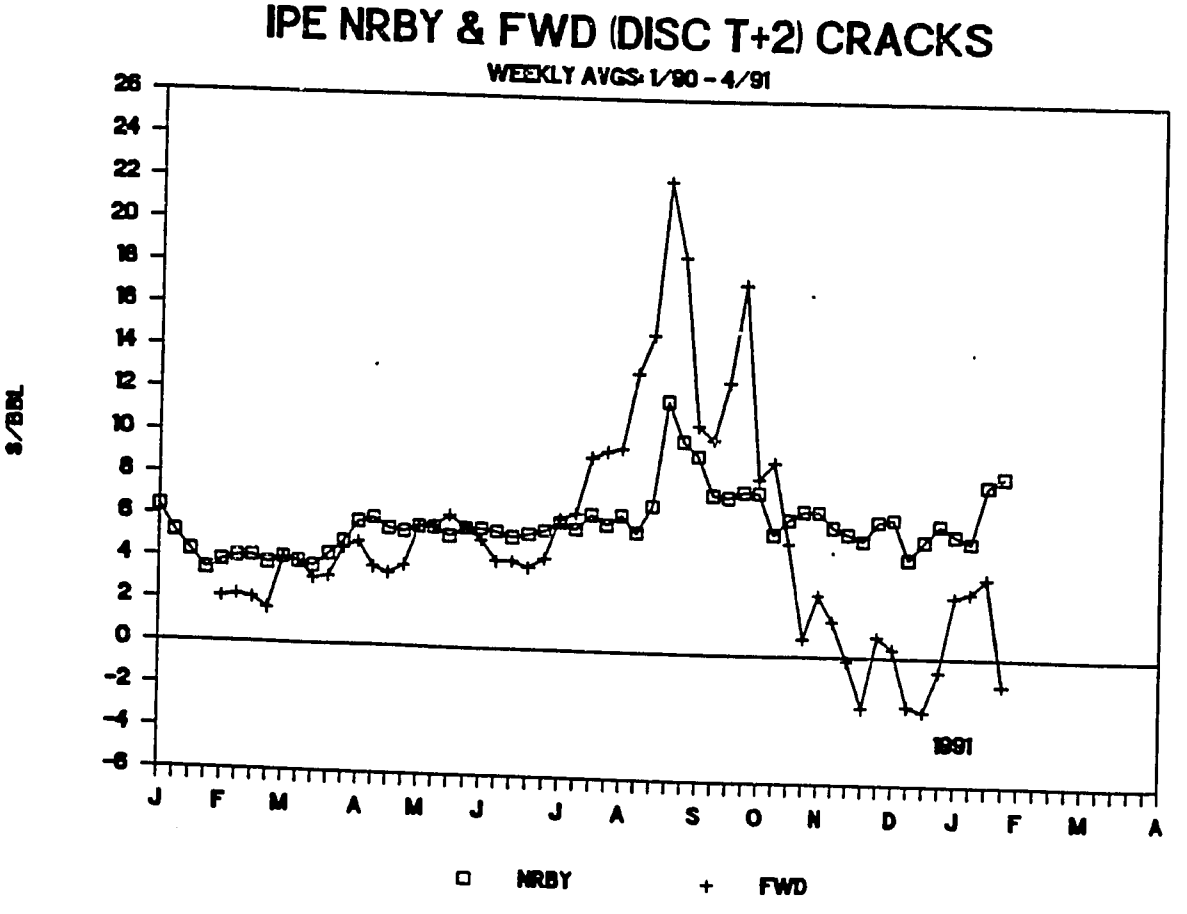


NYMEX NRBY & FWD (DISC T+3) CRACKS

WEEKLY AVGS: 1/90 - 4/91




IPE BRENT NEARBY
WEEKLY AVGS: 1/90 - 4/91
$/BBL
40
38
36
34
32
30
28
26
24
22
20
18
16
14
1991
J F M A M J J A S O N D J F M A


IPE NRBY & FWD (DISC T+2) CRACKS
WEEKLY AVGS: 1/90 - 4/91
$/BBL
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
1991
J F M A M J J A S O N D J F M A
NRBY
FWD

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Theory of Forward Crack as an Indicator of Make vs. Buy Economics and the Direction of Crack Spreads

Forward Crack Trend	Make vs. Buy Translation	Signal for Crack Spread
Bottoms (with Forward Crack Less Than Nearby Crack)	Recently purchased crude oil is high priced relative to expected product values, encouraging reduction of refinery throughput, greater reliance on spot product purchases ... Buy vs. Make	Crack spread is expected to widen as spot product demand will increase, relative to declining refinery output ... take reverse crack spread (sell crude, buy product) until forward crack reverses down or exceeds nearby crack
Peaks (with Forward Crack Greater Than Nearby Crack)	Recently purchased crude oil is low priced relative to expected product values, encouraging higher refinery throughput, less reliance on spot product purchases ... Make vs. Buy	Crack spread expected to narrow as refinery output will increase, relative to declining spot product demand ... take crack spread (buy crude, sell product) until forward crack reverses up or falls below nearby crack

TRADING CRACK SPREADS

(Analysis Steps)

- Selection of appropriate contract months for each"leg" of the spread.

- Analysis of crack spread for its time spread character.

- Assessment of each leg's technical, fundamental and seasonal character individually, as well as jointly.

- Technical and fundamental assessment of the overall spread.

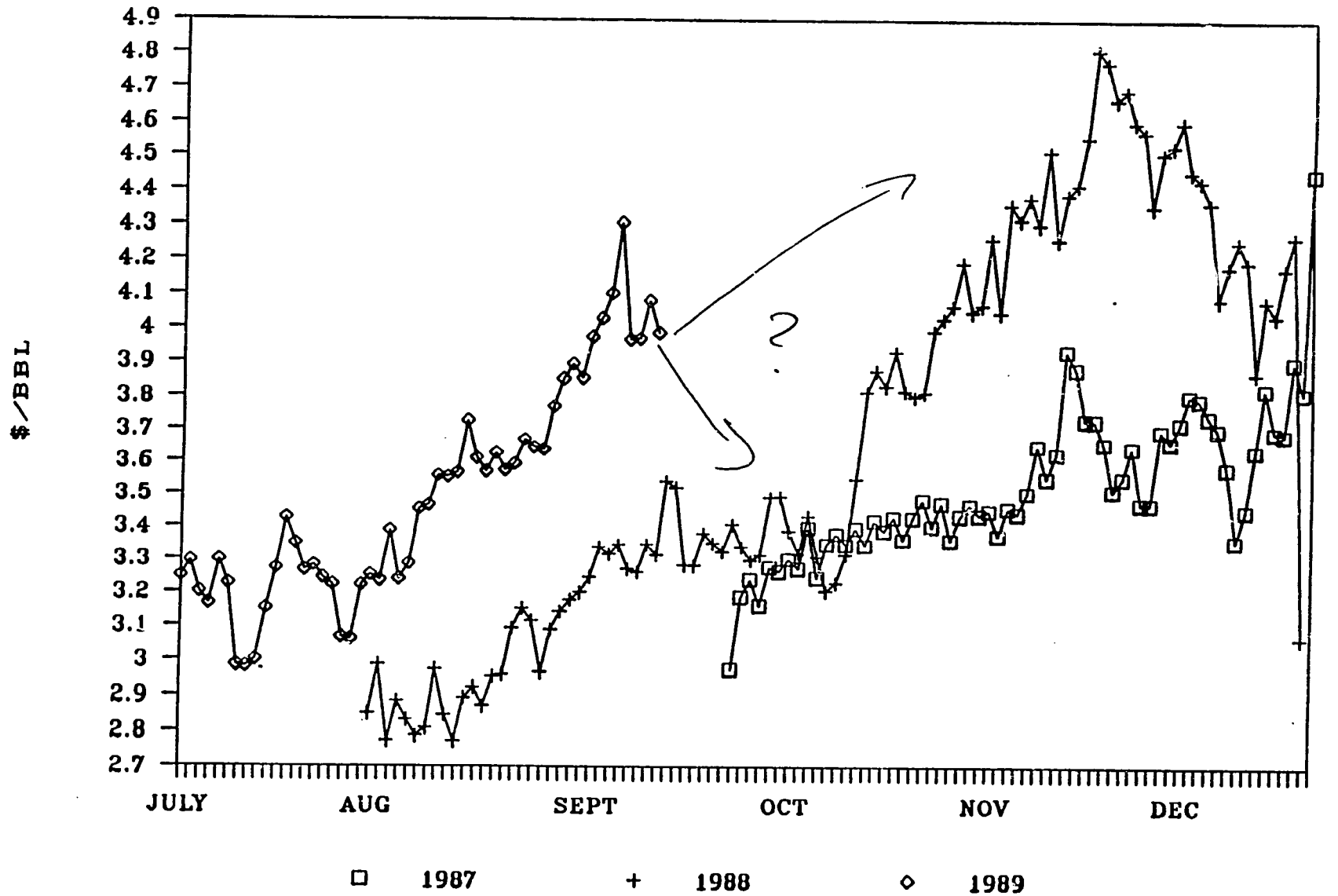
- Crack spread vs. surrogate "netback" value and the role of "the rest of the barrel".

- Comparison of "forward" (or crude pre-priced) vs. nearby crack spread to determine overall "real" pressure on refining margins.

- Contemporaneous vs. "staggered" execution of the crack spread.

- Use of options vs. futures, exchange - traded vs. "over-the-counter".

3/2/1 CRACK: JANUARY CONTRACTS



Section 19

Supply, Refining and Distribution Optimization

EMERGENCY ENERGY PROGRAM FOR EASTERN EUROPE
CRUDE OIL PURCHASING
SUPPLY, REFINING, AND DISTRIBUTION

SUPPLY, REFINING, AND DISTRIBUTION OPTIMIZATION

Presented on
March 16-19, 1992

For
Bulgaria

International Resources Group Inc.

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Figure 13-1

BENEFITS OF IMPROVED COORDINATION

- Better and faster decisions
- Better crude selection and acquisition
- Improved product quality
- More product export possibilities
- More effective product pricing
- Better choices in investment and dis-investment decisions
- Better utilization of capacity

MORE EFFICIENT USE OF EXISTING RESOURCES

- Save energy
- Reduce quality give-away
- Reduce processing Losses
- Improve yields of high value products
- Reduce inventories
- Increase throughput of raw materials

13.0 INTRODUCTION

An oil company's operations (consisting of crude oil supply, refining, and product distribution) constitute a complex logistics system. Each company, in turn, is becoming a part of a region-wide logistics system that encompasses Eastern Europe. Each organization operates its logistics system through a hierarchy of planning and scheduling control functions. Today, the new oil organizations face a new business environment that includes:

- Free trade with the West,
- The move toward privatization,
- Restructuring of existing organizations from one of central control to more de-centralized decisions on the part of individual companies and entrepreneurs.

Simultaneously, a rapid change is occurring in technology, markets, product quality, crude oil prices and sources of supply. In addition, new environmental regulations will have major impact on refining costs and production levels.

As new organizations seek to improve refining margins and gain a competitive advantage, many are turning to improving the performance and coordination of the key functions of supply, refining, and marketing. Coordination is an important concept as it means harmonizing the operations of various business units. Some of the benefits of improved coordination are shown in Figure 13-1.

Figure 13-2

map of country crude line (If Available)

13.1 CRUDE OIL SUPPLY COORDINATION

Crude oil is delivered to refineries primarily by tankers, for those refineries located near the coast, or by pipeline, for inland refineries. The cost of transportation thus becomes an important item in evaluating crude oil purchases. The capacity of each mode is also of vital concern as well as the amount of crude oil storage capacity available at each refinery.

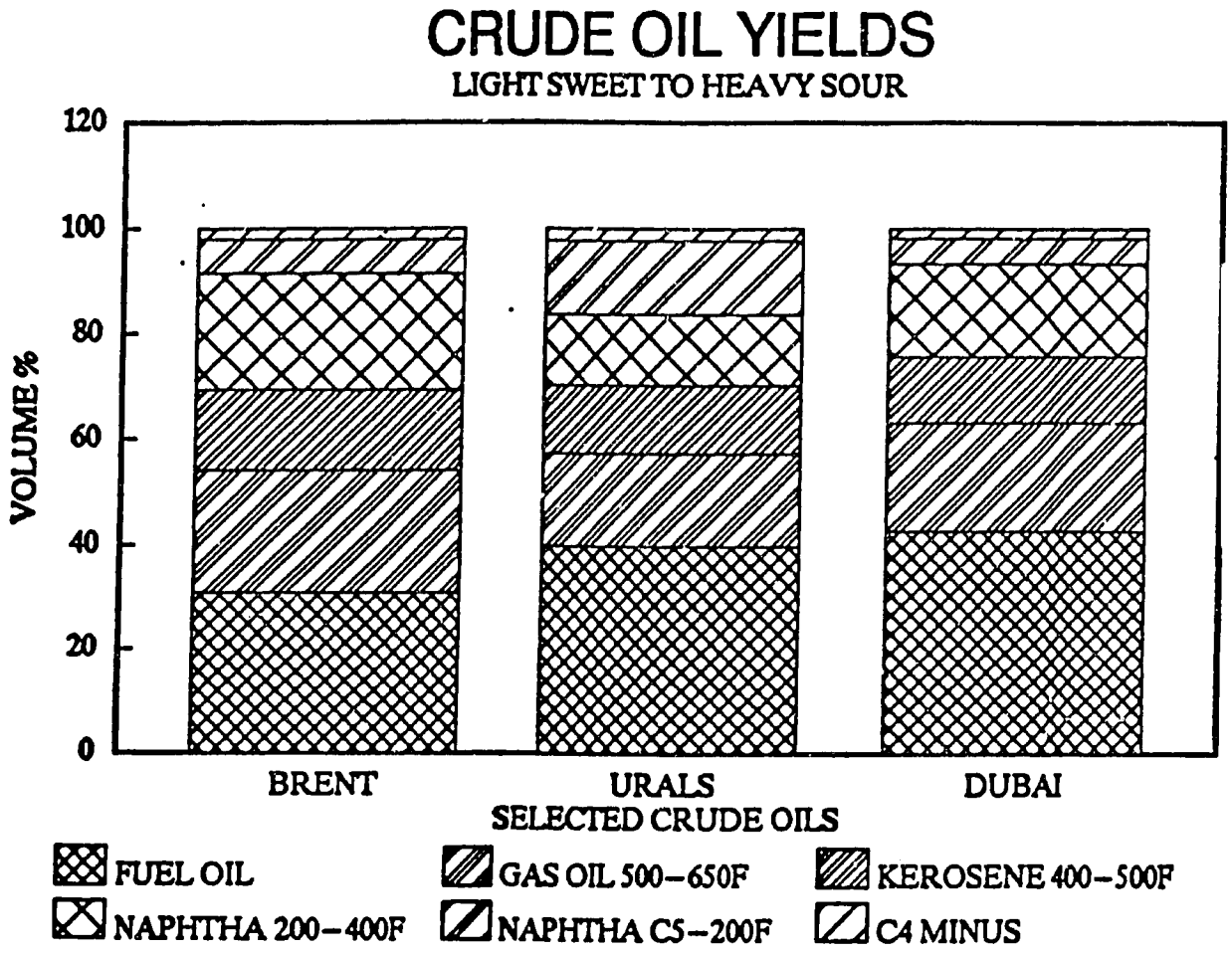
As more crude oil is purchased from the world market, those refiners with access to low cost supply routes will have a cost advantage. What are the economics? How are decisions made that affect the flow of crude oil and its cost?

Figure 13-2 shows the crude supply network for the Country, if available.

13.2 PRODUCT DISTRIBUTION COORDINATION

The distribution of products is driven by the question, "where and who are the customers"? The customers for gasoline and other light fuels are located in the large metropolitan areas, while the customers for heavy gas oils, residual fuel oil and petrochemical feedstocks are not. In fact, most refining complexes are located near or next to petrochemical plants so that product supply is usually made by a short piping connection. It is this supply/demand location imbalance that creates the need for efficient distribution of products. Various modes of transport are available from trucks, to rail cars, to barges, to pipelines, all with different costs per ton. If a market region exists near the border and the product from refineries within the country cannot supply that market at competitive prices, the market share from product imports will rise.

Figure 13-3


CRUDE OIL YIELDS
LIGHT SWEET TO HEAVY SOUR
120
100
80
60
40
20
0
VOLUME %
BRENT
URALS
DUBAI
SELECTED CRUDE OILS
FUEL OIL
GAS OIL 500–650F
KEROSENE 400–500F
NAPHTHA 200–400F
NAPHTHA C5–200F
C4 MINUS

13.3 THE ROLE OF A REFINERY IN CRUDE OIL PURCHASING

A refinery, like any other manufacturing operation, converts raw materials (crude oil and other unfinished oils) into marketable products such as gasoline, heating oil and industrial fuel. The manufacturing process is made more complex by the fact that many products are produced jointly from the same hydrocarbon raw material. Each crude oil may differ significantly in its quality (Sulfur content, Specific Gravity, etc.) which will result in a different yield of final products.

The best mix of crude oils to use in a refinery is determined by the processing capability of each refinery to convert various quality crudes available at different prices to a slate of products that will maximize the difference between product sales revenues and cost of operations. The key indicators used to determine the crude oil to buy are:

- API gravity of the crude oil (the higher the API gravity number, the "lighter or less dense" is the crude oil. A crude with an API gravity of 32 is "lighter" than a crude with an API gravity of 28)

- Sulfur content, expressed in weight per cent. The higher the sulfur content, the more sulfur that must be removed in the refining process, at a cost, to meet product quality specifications.

- The delivered cost of the crude oil to the refinery, which includes the purchase price plus transportation costs by tanker, pipeline, or rail.

Each crude oil will have a different proportion of products that are not proportional to the market demands which requires the refinery to distill, convert, crack, and blend various components to produce the final products. The major components of crude oil, starting with the lightest gases and ending with the heaviest liquids are as follows:

1) Gases, such as methane, ethane
2) Liquified Petroleum Gas (LPG), containing propane and some butane
3) Light gasoline
4) Naphtha for gasoline manufacture or and/or petrochemical feedstocks.
5) Distillates or Light Gas Oils for kerosene, home heating oil or auto diesel fuel.
6) Heavy Gas Oil for industrial fuel or as feed to the catalytic cracking process to make gasoline blend stocks.
7) Residual Fuel Oil for electric power plant fuel or marine fuel.

Crude oils that can yield the greatest percentage of gasoline, naphtha, and distillate fuel oils are considered more valuable, i.e. higher priced, because they will produce products with higher value at a lower cost. The crude oils in this category have an API gravity over 30 ("light") and generally contain less than 1% Sulfur ("Sweet"). The crude oils with an API gravity of under 30 ("Heavy"), generally contain more than 1% Sulfur, some as high as 3.5% ("Sour"). Thus the terms "Sweet crude" and "Sour crude" are used to denote light, low sulfur and heavy, high sulfur, respectively. Some typical yields are shown in Figure 13-3.

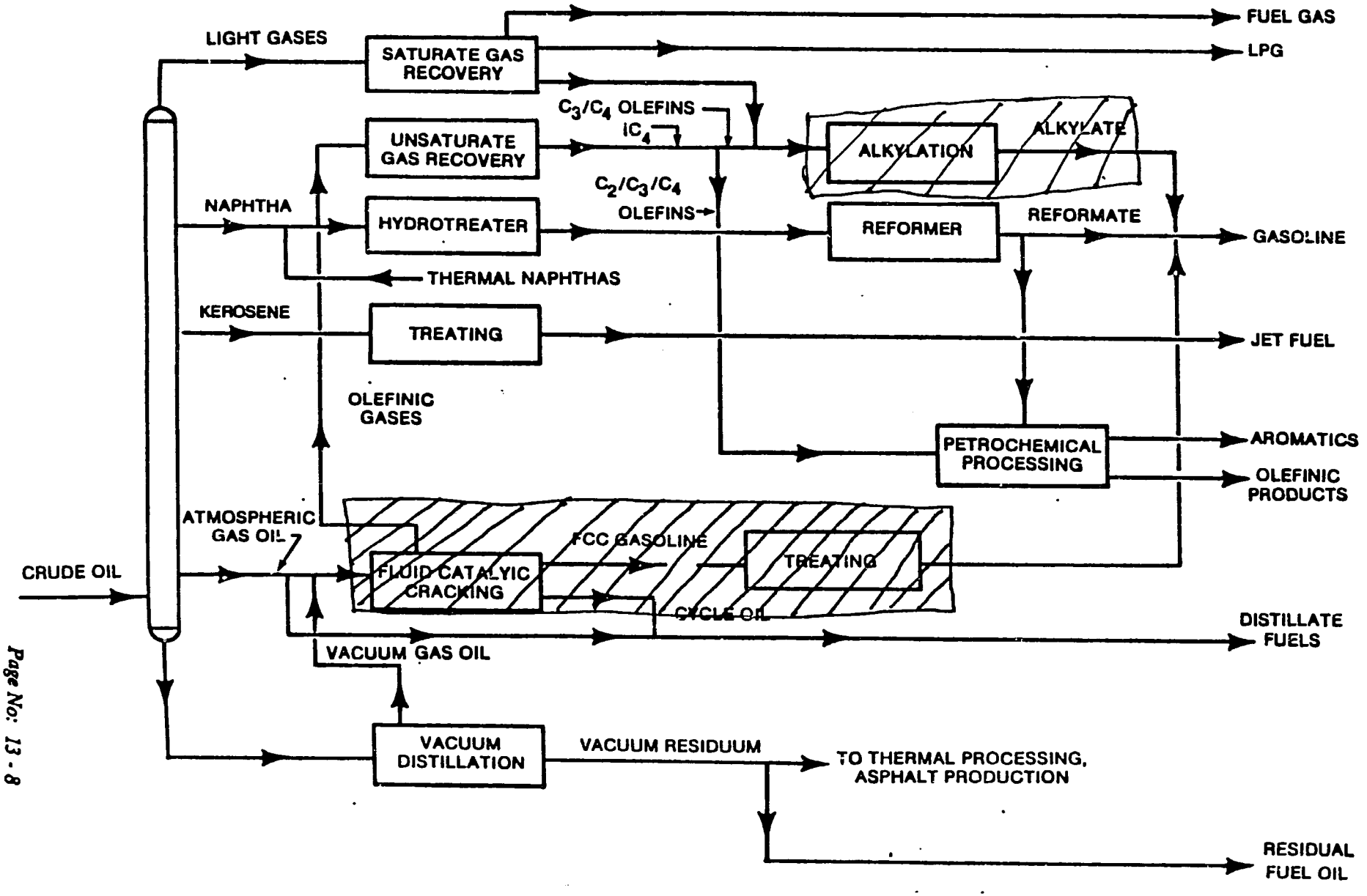


Figure 13-4

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There are four major categories of refineries that produce fuels for transportation and heating. Each category is briefly described in the following paragraphs.

13.3.1 The Topping Refinery

This refinery contains an atmospheric distillation process unit and is sometimes referred to as a "tea kettle" refinery since it does little more than "boil oil". The products made are gas, low octane gasoline, distillate (kerosene, heating oil and other light gas oils) and unfinished residual oil which contains the heavy gas oil. Since only a few products are marketable, primarily the distillates, the refinery sells its unfinished materials to refiners with more complex and sophisticated process units.

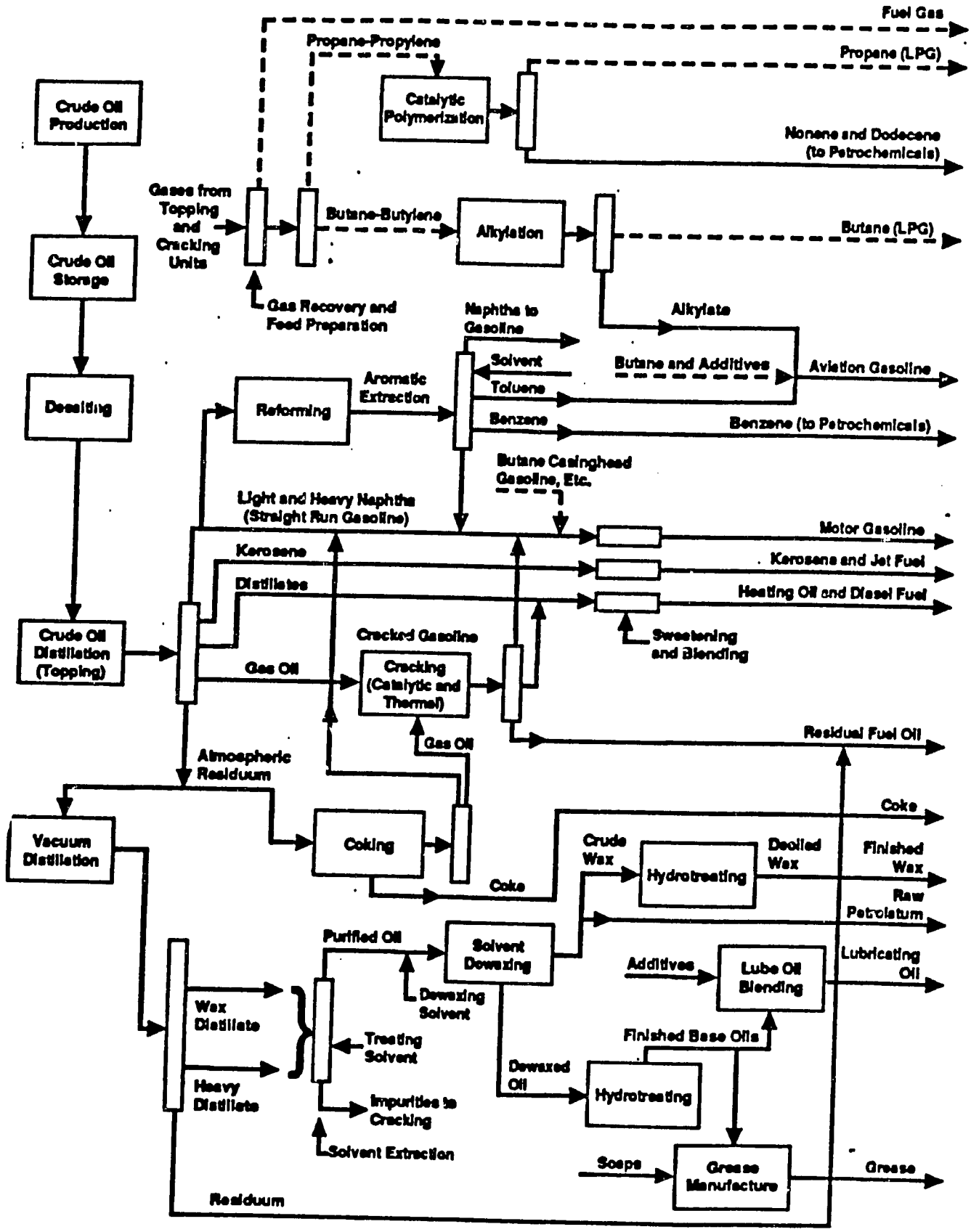
13.3.2 The Reforming (Hydroskimming) Refinery

This refinery category is an advance over the "tea kettle" since the catalytic reforming process raises the octane number of naphtha which permits the sale of motor gasoline. The term "Hydroskimming" is used because the reforming process produces Hydrogen, which is used to reduce the sulfur content of fuel oils and the naphtha is "skimmed" from the crude oil and upgraded to gasoline blend stock.

13.3.3 The Reforming/Cracking Refinery

These refineries usually consist of Vacuum Distillation and catalytic cracking processes, in addition to catalytic reforming. The cracking processes may be Fluid Catalytic Cracking (FCC) and/or Hydrocracking. These cracking processes allow the heavy gas oils to be upgraded to the more valuable light products such as gasoline. The cracking mode of operation represents the U.S. industry marginal mode of production which, in turn, generally determines the basic crude oil/product price relationship. This is where the term and concept of the "crack spread" originated in the futures market. An illustration of this refinery is shown in Figure 13-4.

Figure 13-5



Source: National Petroleum Council, *U.S. Petroleum Refining*, October 1986, Appendix C.

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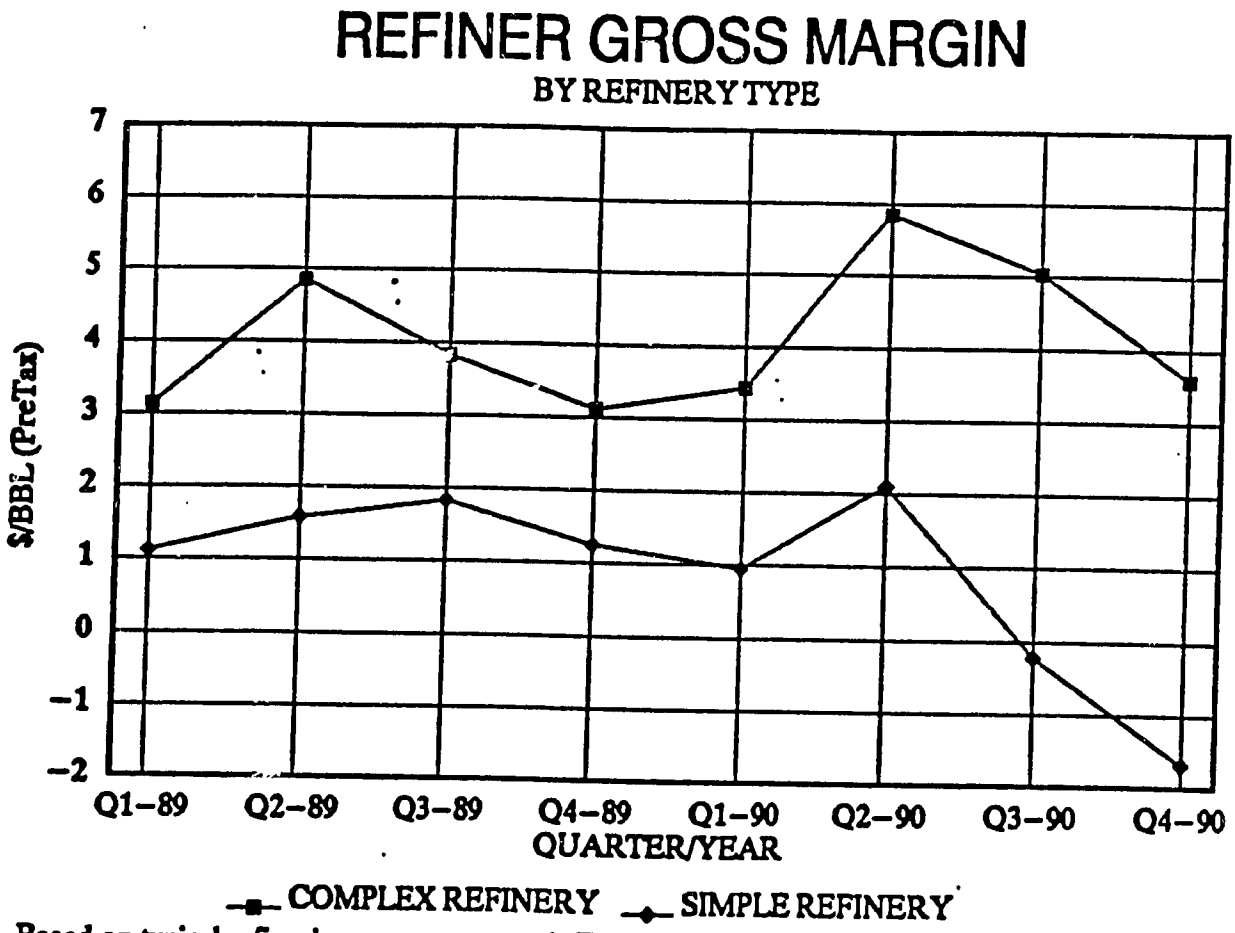
13.3.4 The Reforming/Cracking/Coking Refinery

This category of refinery is the most complex of all. The addition of a Coking process unit, with a large capital investment, allows the refiner to upgrade residual oil from heavy crudes to make "lighter" products, such as gasoline and heating oil. Thus, refiners with this equipment are in a good position to take advantage of the market price spread between light and heavy crude oils and/or the market for residual fuel oil. An illustration is shown in Figure 13-5.

Figure 13-6



Based on typical refineries, average quarterly European prices

13.4 MANAGING THE REFINERY

The management of a refinery has a goal of producing the market demand for products at the least cost. During the last two years, major price swings, due to the Iraq invasion of Kuwait, have occurred in the world oil market. As a result, the refining industry has experienced changes in profitability as shown in Figure 13-6. This illustrates the impact of crude prices for both a simple and complex refinery are shown. The manager of a complex refinery was in a better position to respond to changes in market forces. The Gross Refining Margin is the difference between product revenues and the cost of crude oil and variable operating costs. Refiner fixed costs are not included.

The margin for a complex refinery is greater than that for a simple refinery due to its ability to upgrade the heavy oil to higher value light products. As oil prices rose rapidly in the fall of 1990, the refiner margins dropped and the simple refiner shows a loss of almost $2.00/BBL by the fourth quarter.

Figure 13 -7
Typical Costs

Cost item	Simple Refinery	Complex Refinery
Raw Material	89.7	87.0
Variable Costs	1.8	2.2
Fixed Costs	8.5	10.8
Total	100.0	100.0

REFINERY TYPE	SIMPLE		COMPLEX	
NELSON COMPLEX. FACTOR	5.15		10.69	
AVE. SIZE, MB/CD	20		168	
	$/BBL	%	$/BBL	%
COST CATEGORY				
FIXED				
PAYROLL,PAYROLL RELATED	0.48	31.3%	0.62	32.6%
CONTRACT MAINTENANCE	0.08	5.2%	0.13	6.8%
MAINTENANCE MATERIALS	0.15	9.8%	0.19	10.0%
OBSOLESCENCE & IMPROVEMENT	0.52	34.0%	0.40	21.0%
OTHER OPERATING EXP.	0.30	19.7%	0.56	29.6%
TOTAL FIXED	1.53	100.0%	1.90	100.0%

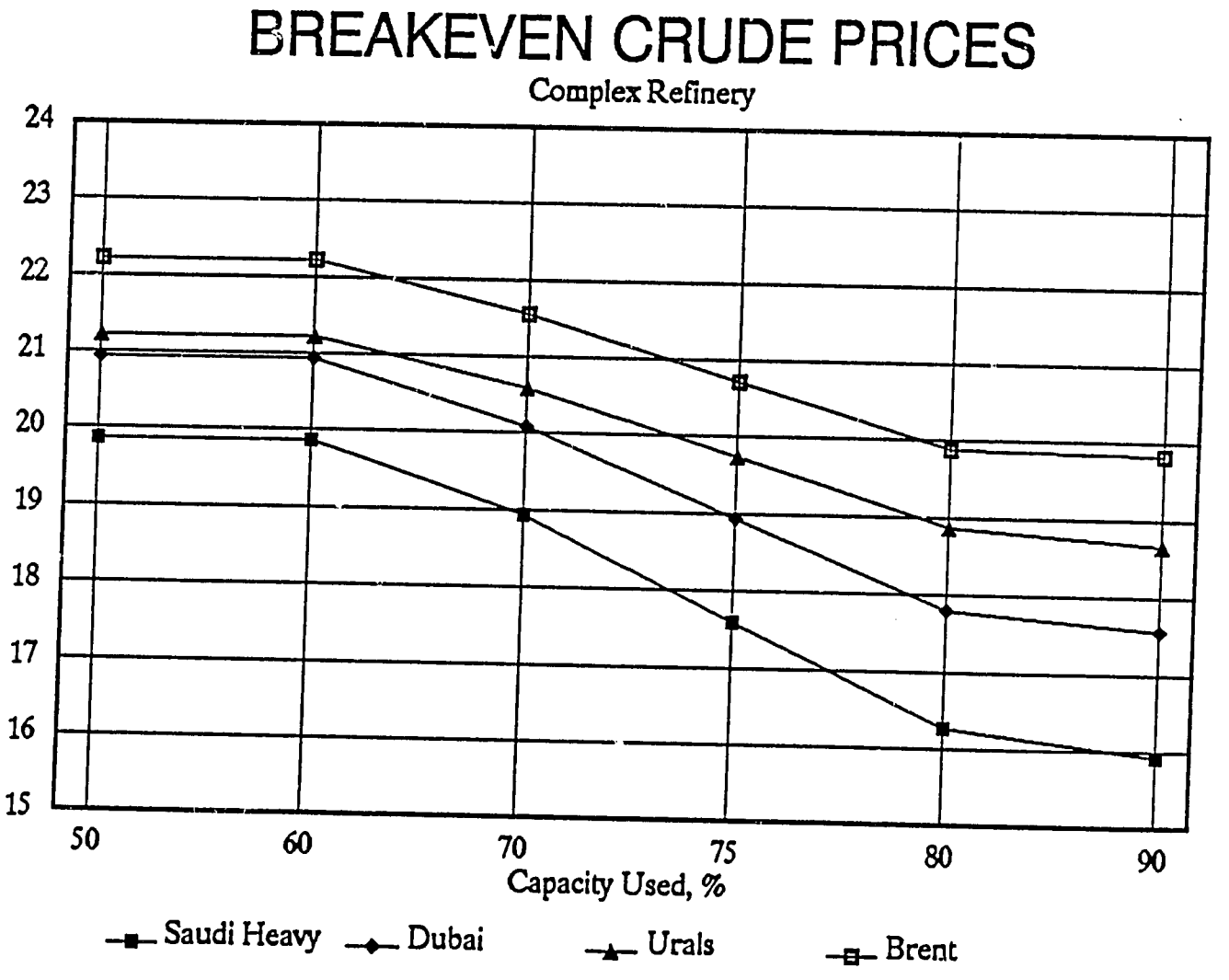
Every effort should be made to identify crude oil purchase opportunities that have the best cost/value relationship. The cost of crude alone is not sufficient. Crude oils are not created "equal", some have greater value than others because their physical and chemical properties permit them to be refined into finished products at a lower cost. The value of a given crude oil also depends heavily on the refinery process units available. What might be a "great buy" on a heavy, sour crude for the operator of a cracking/coking refinery, may be a very poor value for the operator of a "Hydroskimming" refinery. The largest single component of refinery costs is the cost of crude as shown in Table 13-1.

Table 13-1
Typical Percentage Cost Breakdown[1]

Cost item	Simple Refinery	Complex Refinery
Raw Material	89.7	87.0
Variable Costs	1.8	2.2
Fixed Costs	8.5	10.8
Total	100.0	100.0

[1]"U.S. Petroleum Refining", National Petroleum Council, October, 1986

Figure 13 - 8


BREAKEVEN CRUDE PRICES
Complex Refinery
24
23
22
21
20
19
18
17
16
15
50
60
70
75
80
90
Capacity Used, %
Saudi Heavy
Dubai
Urals
Brent

13.4.1 Role of Refinery Utilization

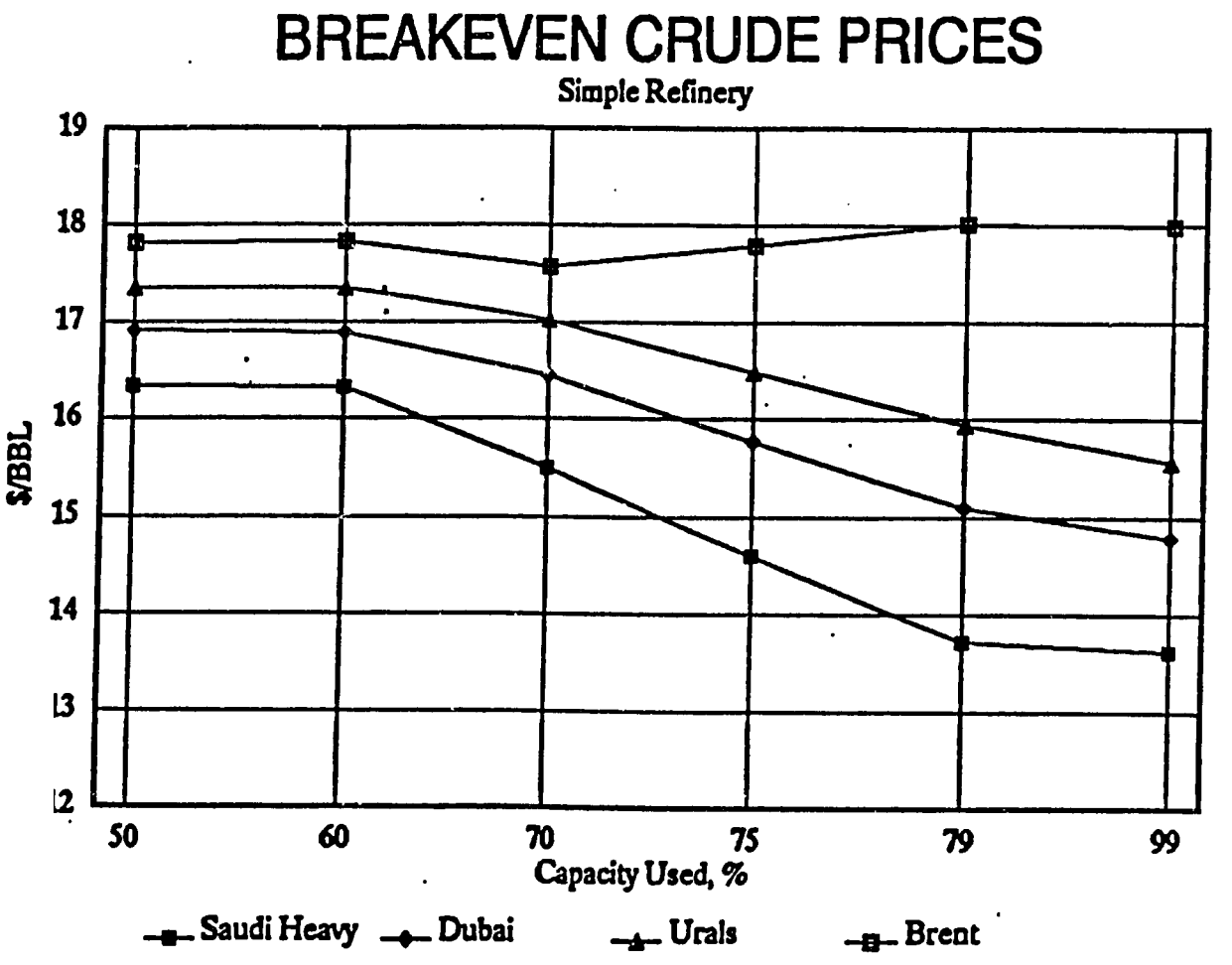
The level of refinery utilization plays a major role in the determination of netback prices for crude oil. When a refinery is operating at a rate where the downstream conversion units such as the fluid cat cracker, coker, and the reformer are at capacity, incremental barrels of crude cannot be transformed into high value gasoline and the breakeven price for that crude is lower than it would be at lower throughput. This is illustrated in Figure 13-8 and 13-9 where we have simulated both a high conversion complex refinery and a simple refinery using second quarter 1990 product prices with each refinery running from 50% to 95% of operable capacity.

1. BRENT - U.K. North Sea - high API gravity, low sulfur
2. URALS - USSR Export - medium API gravity, medium sulfur
3. DUBAI - Mid East - low API gravity, high sulfur
4. SAH - Saudi Heavy - low API gravity, high sulfur

As can be seen from the chart, the breakeven value of these crude oils drops by over 3.00$/bbl. The key break occurs between 70% and 80% of distillation capacity. At this point, the downstream conversion units reach capacity and the refinery cannot produce any more high value gasoline blending stocks.

The breakeven price indicates the value of each crude to the refiner. If the crude oil can be obtained for <u>less</u> than this value, the refiner gross margin increases.

Figure 13 - 9



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The refinery processing configuration also plays and important role as seen in Figure 13-9, which shows the value of a heavy sour crude to a simple hydroskimming refinery dropping by almost $2.00/BBL from 70 to 80 % of capacity. The simple refinery is at a competitive disadvantage in the processing of heavy, sour crude oils. In contrast, the value of a light crude oil, such as Brent, does not drop as this crude is more easily processed to make light products.

13.5 BASIS FOR CASE STUDY (GEOCO)

As a basis for the seminar case study of a hypothetical oil company, let us consider a company named **GEOCO** (Greater European Oil Company). GEOCO operates two refineries, the first is a fairly simple "hydroskimming" refinery that consists of atmospheric crude distillation and catalytic reforming for gasoline production, its capacity is 100 MB/D. The second refinery also at 100 MB/D contains a reformer, fluid catalytic cracking unit (FCC) and hydrocracker . The refineries produce the following product slates:

- Premium Gasoline (92 Road Octane & .4 g/l Lead)
- Regular Gasoline (88 Road Octane & 0.15 g/l Lead)
- Kerosene
- Gas Oil
- Residual Fuel Oil (<= 1% Sulfur)
- Residual Fuel Oil (<= 3.8% Sulfur)
- Petrochemical Feedstocks

About 50% of the crude oil supply is based on long-term contracts, but additional crude must be purchased on the world market. The refineries distribute products to their local tributary area and also supply a marketing company with products for resale. Some products may be imported and some products are targeted for the export market The problems facing GEOCO are that the terms and availability of the long-term contract for crude supply have changed with both a reduction in volume and an increase in price. Increased environmental regulations will also have an impact as the refineries will have to reduce the sulfur content of fuel oil as well as the amount of lead added to the premium gasoline. New opportunities have also arisen in the area of product exports to other countries.

13.5.1 Company Planning Methods

The company has a history of planning that they have defined as follows:

	Planning Level	Time Frame
A)	Scheduling Operations in each refinery	Hourly/Daily
B)	Operations Planning in each refinery	Daily/Weekly
C)	Tactical System Operations planning	1 to 6 months
	(Considers supply of crude oil to both refineries and product distribution)	
D)	Strategic System Planning	1 to 5 years
	(Considers what type of Investments will be needed and where)	

At each planning level the company has mathematical models that aid in decision making. For levels B, C, and D, these models use Linear Programming (LP) to obtain solutions.

The model of type B is a detailed refinery simulation model that contains over 250 equations and 500 variables that represent processing and blending operations. The capabilities of this refinery yield simulation model are:

Crude Oils Assays

Over 50 crude oils including West Texas Intermediate, Arab Light, U.K. Brent.

Products:

- Leaded and Unleaded gasolines
- Jet Fuels
- No. 2 Heating Oil
- Gas Oil
- Naphtha
- No. 6 residual fuel oil (at various sulfur levels)
- LPG and other products

Refinery Process Units:
Twenty-three units including crude distillation, coking, reforming, fluid catalytic cracking, hydrocracking, alkylation, isomerization.

Objective Function:
Maximize refiner's gross profit margin (excluding taxes and fixed costs). Alternatively, the total costs may be minimized.

These models are used to:

1. Determine crude replacement value to a refinery in a given region.
2. Determine refined product yield netbacks for selected crudes using reported spot prices.
3. Determine the incremental cost of producing products at different levels of capacity utilization.
4. Determine crude and product values as a function of refinery complexity (i.e., cracking, high conversion refinery vs. a hydroskimming low conversion refinery).
5. Determine refining cost for petrochemical naphtha production.
6. Evaluate capacity expansion investments.

These refinery yield simulation models provide a quantitative picture of the marginal value of crudes and products to a given refinery configuration. The major advantage of using these LP models is that the results represent both the optimal production levels and marginal prices for crude oils and products.

We have used a model of type B, Operations Planning (OP) to illustrate the case study examples in this section and to provide attendees with a simulation of "real life" business situations.

13.6 PLANNING BASIS

Several types of crude oil can be processed by the refineries. The major crude run has its volume set by contract, the other crudes are "marginal" and are purchased on the spot market. The refineries can process the crude oils in a variety of ways, however, the processing equipment available in each refinery will restrict certain operations. The three major products considered are gasoline, gas oil (heating oil) and residual fuel.

The objectives of the managers of our "hypothetical refineries", which represent fairly typical planning problems, are:

- Determine an optimum base case which will include
  - Crudes to be purchased and crude transportation needs.
  - Refinery crude runs and operating modes.
  - Incremental or marginal cost of each product.
- Determine the economic incentive for changing the contract which fixes the volume of the base crude.

Typical Questions to be answered are:

- What can be done in the next few months with our existing equipment to cope with higher crude prices and survive as a business?
- Which crude oils should be bought and which refinery should process them?
- What is the value (price) to each refinery for Saudi Heavy?, for Nigerian Bonny Light?, for U.K. Brent?, for Urals?
- To what extent can the product mix be varied so that a given refinery can supply a marketing region? What are the costs of these alternative product mixes?
- What is the product slate that will give the highest operating margin?
- For each alternative product mix, what is the least cost operating plan?
- For the future, what new or revamped process units might be needed?

Table 13 - 2
Case Study Crude Prices

Crude Oil	Price ,$/bbl	Volume, Mbbl/day
Urals- USSR	14.70	45.2 (fix)
Dubai- UAE	15.40	50 (max)
Brent- UK	17.50	50 (max)

Table 13-3
Refinery Product Demands
Refinery "Gate" Prices

Product	Volume,MB/D	Price, $/BBL	Price, $/liter
Prem. Mogas 92	8.0	25.75	0.160
Reg. Mogas 88	25.0	24.10	0.149
Kerosene	9.0	21.25	0.132
No. 2 Gas Oil	30.0	20.8	0.129
Fuel Oil 1%S	as produced	12.60	83.80/MeT
Fuel Oil 4%S	as produced	10.7	71.15/MeT
Petrochem. Nap.	22.0	27-28	
Asphalt	10	15.00	

13.6.1 Case Study Data

The data displayed in this section is fairly representative of industry data but is intended for illustrative purposes only.

- Crude Supply and Costs (at the refinery gate), see Table 13 - 2
  Urals crude is a medium quality crude oil whose volume and price are fixed by contract. Dubai crude is a heavy, sour crude with low quality for fuel and distillates. Brent crude is a high quality light sweet crude.

13.6.2 Product Demands

Each refinery must supply product demands in its local area. For these examples, we have assumed the same volumes and prices for each refinery as shown in Table 13-3.

Table 13 - 4

Processing Capacities

PROCESSING CAPACITIES				
	REFINERY RC		REFINERY RS	
	COMPLEX		SIMPLE	
	CAPACITY		CAPACITY	
PROCESS UNIT	(MB/CD)	KT/YR	(MB/CD)	KT/YR
CRUDE DISTILLATION	100.0	5000	100.0	5000
VACUUM DISTILLATION	41.6	2277	29.5	1617
COKER-DELAYED	0.0	0	0.0	0
VISBREAKER	0.7	41	0.0	0
NAPHTHA HYDROTREATER	22.9	984	20.0	859
DISTILLATE HDS	21.0	1024	16.0	779
FCC FEED HYDROFINER	10.4	504	9.0	438
RESID DESULFURIZER	3.1	171	0.0	0
CAT REFORMER 150 PSI	24.0	1031	20.0	859
FLUID CAT CRACKER	37.4	1845	0.0	0
GASOLINE SPLTR	2.9	125	2.2	94
HYDROCRACKER-DIST.	5.4	267	0.0	0
ALKYLATION PLANT	7.6	277	0.0	0
CAT POLYMERIZATION	0.3	12	0.0	0
AROMATICS PLT	0.3	12	0.0	0
PEN/HEX ISOMERIZATION	1.9	81	1.0	42
BUTANE ISOMERIZATION	0.2	7	0.0	0
LUBE + WAX PLANTS	1.8	91	4.6	240
SOLVENT DEASPHALTING	2.8	145	3.1	162

13.6.3 Refinery Processing Capacities

The nominal operating capacity of each unit for the complex and simple refineries used in the case study is shown in Table 13 - 4.

The capacities shown are meant to be representative for each type of refinery and do not reflect any specific plant. The main differences are the lack of heavy oil conversion units in the simple refinery, namely catalytic cracking and hydrocracking.

Table 13-5
Production Report Complex Refinery

PRODUCTION REPORT COMPLEX REFINERY						
PRODUCTS	INPUT PRICE $/BBL	CALC. STOCK VALUE,$/B	PRICE MINUS VALUE	TOTAL REVENU M$/D	FLOW RATE MB/D	RATE LIMIT MB/D
L.P.G.	10.00	10.00	0.00	108.1	7.6	
MOGAS,PRM 92 Oct,.4g/l	25.75	17.32	8.43	206.0	8.0	8.0
MOGAS,PRM 92 Oct,.15g/l	0.00	0.00	0.00	0.0	0.0	0.0
MOGAS,REG 88 Oct,.15g/l	24.10	16.16	7.94	602.5	25.0	25.0
JET KEROSENE	21.25	21.14	0.11	191.3	9.0	9.0
GAS OIL	20.80	20.80	0.00	425.8	20.5	30.0
FUEL OIL < 1% Sul	12.60	12.60	0.00	0.0	0.0	
FUEL OIL < 4% Sul	10.70	10.70	0.00	0.0	0.0	
PETROCHEM FEED	27.00	27.00	0.00	405.5	16.7	
LUBES,ASPHALT,ETC	19.99	19.99	0.00	213.0	11.5	11.5
TOTAL SALEABLE				2152	98.2	
PLANT FUEL BURNED					5.9	
LOSS (GAIN)					-3.9	
TOTAL				2152	100.3	

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13.7 BASE CASE RESULTS

The results of the computer simulations (using Linear Programming) for the two refineries are shown in the following pages.

The refinery gate prices for products are based on ARA second quarter 1990 averages. The crude oil prices are also based on average quotes for that period and include an estimate for transportation costs from the point of origin to Eastern Europe. The gasoline octane numbers shown are "Road Octane" based on the formula (Research Octane + Motor Octane)/2 = 92 for Premium gasoline.

13.7.1 Complex Refinery Production Report

The key values to note in the production report are in the "price minus value" column which show the marginal change in refiner margin for incremental sales of products. For example, if additional markets could be found for Regular Low Lead gasoline, a possible margin of $7.94/BBL could be realized by the refinery. The refinery production of gasoline is at the maximum demand for both grades. Also note that there is no fuel oil produced in this plan, the upgrading equipment is working hard since the price for fuel oil is quite low.

Table 13 - 6
Raw Material Report Complex Refinery

RAW MATERIALS REPORT COMPLEX REFINERY						
CRUDE OILS	INPUT COST $/BBL	CALC. STOCK VALUE,$/B	VALUE MINUS COST	TOTAL COST M$/D	FLOW RATE MB/D	RATE LIMIT MB/D
USSR URALS	14.70	16.47	1.77	664.4	45.2	45.2
U.K. BRENT	17.50	17.50	0.00	124.3	7.1	50.0
SAUDI LIGHT	0.00	0.00	0.00	0.0	0.0	
SAUDI MEDIUM	0.00	0.00	0.00	0.0	0.0	
DUBAI	15.40	15.40	0.00	734.3	47.7	50.0
IRAN HEAVY	0.00	0.00	0.00	0.0	0.0	
TOTAL CRUDE OIL				1523.0	100.0	
OTHER INPUTS						
Nat. Gas Liquids,etc.	18.00	18.00	0.00	5.0	0.3	
Alcohols/Ethers	0.00	0.00	0.00	0.0	0.0	
OTHER TOTAL				5.0	0.3	
TOTAL				1528.1	100.3	

13.7.2 Complex Refinery Raw Material Report

The Raw Materials Report shown in Table 13-6, shows the crude oils processed and the incremental value to the refiner of each crude, as shown in the "value minus cost" column. The current price of $14.70 for Urals crude oil is $1.77 less than the refiner might be willing to pay. That is, additional barrels of this crude at $14.70 will yield an increase in the gross margin of $1.77 per barrel.

The incremental refining value for Brent and Dubai are 0.00, or equal to the current acquisition price.

Table 13 - 7

Economic Summary Complex Refinery

REFINERY ECONOMICS COMPLEX REFINERY			
	M$/DAY	MM$/YR	$/BBL
PRODUCT REVENUE	2152.0	785.5	21.46
RAW MATERIAL COST			
CRUDE OIL	1528.1	557.8	15.24
GROSS MARGIN	623.9	227.7	6.22
PROCESSING COSTS			
GASOLINE ADDITIVES(TEL)	11.7	4.3	0.12
PURCHASED UTILITIES	9.8	3.6	0.10
OTHER VARIABLE COSTS	17.5	6.4	0.17
SUB-TOTAL PROCESSING	39.0	14.2	0.39
GROSS MARGIN(PreTax/Depr.)	584.9	213.5	5.83
FIXED COST	190.0	69.4	1.89
NET MARGIN	394.9	144.1	3.94

13.7.3 Complex Refinery Economic Summary Report

A brief summary of the economics for the "hypothetical" complex refinery, shown in Table 13-7, indicates the "Gross Margin" before taxes and depreciation is $5.83 for the base case. If fixed costs are included, the margin drops to $3.94.

Table 13 - 8

Production Report Simple Refinery

PRODUCTION REPORT SIMPLE REFINERY						
PRODUCTS	INPUT PRICE $/BBL	CALC. STOCK VALUE,$/B	PRICE MINUS VALUE	TOTAL REVENUE M$/D	FLOW RATE MB/D	RATE LIMIT MB/D
L.P.G.	10.00	10.00	0.00	32.7	2.1	
MOGAS,PRM 92 Oct,.4g/l	25.75	25.25	0.50	206.0	8.0	8.0
MOGAS,PRM 92 Oct,.15g/l	0.00	0.00	0.00	0.0	0.0	0.0
MOGAS,REG 88 Oct,.15g/l	24.10	24.10	0.00	135.2	5.6	25.0
JET KEROSENE	21.25	21.25	0.00	33.6	1.6	9.0
GAS OIL	20.80	20.80	0.00	506.1	24.3	30.0
FUEL OIL < 1% Sul	12.60	12.60	0.00	368.2	29.2	
FUEL OIL < 4% Sul	10.70	10.70	0.00	0.0	0.0	
PETROCHEM FEED	27.00	27.00	0.00	362.9	13.4	
LUBES,ASPHALT,ETC	19.99	19.99	0.00	213.0	11.5	11.5
TOTAL SALEABLE				1857.6	95.7	
PLANT FUEL BURNED					5.5	
LOSS (GAIN)					0.5	
TOTAL				1857.6	101.7	

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13.7.4 Simple Refinery Production Report

The production report for the Simple Refinery is a marked contrast to the Complex case. Note that only Premium gasoline is produced to the maximum, with substantial volumes of fuel oil produced. The Regular gasoline demand of 25 MB/D cannot be met as only 5.6 MB/D are made. There is no incentive for this refiner to sell more Regular, only an increase in Premium sales are marginally profitable at $0.50 /BBL. Without the processing equipment available to the complex refiner, this operation cannot upgrade fuel oil to sell more valuable light products and suffers from a low operating margin.

Table 13 - 9
Raw Materials Report Simple Refinery

RAW MATERIALS REPORT SIMPLE REFINERY						
CRUDE OILS	INPUT COST $/BBL	CALC. STOCK VALUE,$/B	VALUE MINUS COST	TOTAL COST M$/D	FLOW RATE MB/D	RATE LIMIT MB/D
USSR URALS	14.70	16.01	1.31	664.4	45.2	45.2
U.K. BRENT	17.50	17.50	0.00	644.4	36.8	50.0
SAUDI LIGHT	0.00	0.00	0.00	0.0	0.0	
SAUDI MEDIUM	0.00	0.00	0.00	0.0	0.0	
DUBAI	15.40	15.40	0.00	276.6	18.0	50.0
IRAN HEAVY	0.00	0.00	0.00	0.0	0.0	
TOTAL CRUDE OIL				1585.4	100.0	
OTHER INPUTS						
Nat. Gas Liquids,etc.	18.00	18.00	0.00	30.6	1.7	
Alcohols/Ethers	0.00	0.00	0.00	0.0	0.0	
OTHER TOTAL				30.6	1.7	
TOTAL				1616.9	101.7	

13.7.5 Simple Refinery Raw Material Report

The Raw Materials Report shown in Table 13-9, shows the crude oils processed and the incremental value to the refiner of each crude, as shown in the "value minus cost" column. The current price of $14.70 for Urals crude oil is $1.31 less than the refiner might be willing to pay. That is, additional barrels of this crude at $14.70 will yield an increase in the gross margin of $1.31 per barrel.

The volume of Brent crude at 36.8 MB/D is much higher than the complex refinery which processed only 7.1 MB/D. The lack of heavy oil upgrading hampers this refinery in processing the Dubai crude oil and they need the lighter, but more costly Brent.

Table 13 - 10
Economics Report Simple Refinery

REFINERY ECONOMICS SIMPLE REFINERY			
	M$/DAY	MM$/YR	$/BBL
PRODUCT REVENUE	1857.6	678.0	18.27
RAW MATERIAL COST			
CRUDE OIL	1616.0	589.8	15.89
GROSS MARGIN	241.6	88.2	2.38
PROCESSING COSTS			
GASOLINE ADDITIVES(TEL)	19.1	7.0	0.19
PURCHASED UTILITIES	0.3	0.1	0.00
OTHER VARIABLE COSTS	12.3	4.5	0.12
SUB-TOTAL PROCESSING	31.6	11.6	0.31
GROSS MARGIN(PreTax/Depr.)	210.0	76.6	**2.06**
FIXED COST	153.0	55.8	1.50
NET MARGIN	57.0	20.8	**0.56**

13.7.6 Simple Refinery Economic Summary Report

A brief summary of the economics for the "hypothetical" simple refinery, shown in Table 13-10, indicates the "Gross Margin" before taxes and depreciation is $2.06 for the base case. If fixed costs are included, the margin drops to $0.56. The margin is about $3.80 below that of the complex refiner.

Figure 13-10

SUMMARY OF REFINERY YIELDS

	COMPLEX	SIMPLE
GROSS MARGIN,$/BBL	5.83	2.06
CRUDE FLOW,MB/D		
BRENT	7.1	36.8
URALS	45.2	45.2
DUBAI	47.7	18.0
TOTAL	100.0	100.0
PRODUCTS,MB/D		
PRM MOGAS	8	8
REG MOGAS	25	5.6
JET/KERO	9	1.6
GAS OIL	20.5	24.3
FUEL OIL	0	29.2
PETROCHEMICALS	16.7	13.4
OTHER	19	13.6
TOTAL	98.2	95.7

13.7.7 Summary of Refinery Yields

A summary of the major product yields for both the Complex and Simple Refineries is shown in Figure 13-10.

Table 13 - 11

Case Study Crude Prices
(At Refinery Gate)

Crude Oil	Price ,$/BBL	Volume, MBBL/day
Urals- USSR	14.70	45.2 (max)
Dubai- UAE	15.40	40 (max)
Brent- UK	17.50	50 (max)

13.8 The "Sample Refinery" - A Basis for Case Studies

The case studies we will discuss is based on a "Sample Refinery" that has been adapted for the seminar. We have altered some of the data to provide a better representation of a European refinery.

13.8.1 Case Study Data

The data displayed in this section is fairly representative of industry data but is intended for illustrative purposes only.

- Crude Supply and Costs (at the refinery gate), see Table 13 - 11
  Urals crude is a medium quality crude oil whose volume and price are fixed by contract. Dubai crude is a heavy, sour crude with low quality for fuel and distillates. Brent crude is a high quality light sweet crude.

Table 13 - 12

Refinery Product Demands
Refinery "Gate" Prices

Product	Volume,MB/D	Price, $/BBL	Price, $/liter
Prem. Mogas 92 Export Local-1 Local-2	 2.5 1.0 1.5	 25.75 23.65 21.55	0.160
Reg. Mogas 88 Export Local-1 Local-2	 10.0 2.0 8.0	 24.10 22.00 18.00	0.149
Kerosene Export Local-1	 7.0 3.0	 21.25 19.25	0.132
No. 2 Gas Oil Export Local-1 Local-2	 8.0 5.0 10.0	 21.80 21.00 20.20	0.129
Fuel Oil 1%S Min. Contract Imports	 4.0 10 (max)	 12.60 12.75	83.80/MeT
Fuel Oil 4%S Min. Contract Imports	 1.0 10 (max)	 10.70 10.85	71.15/MeT
Petrochem. Nap.	20.0	27-28	
Asphalt	2.5	15.00	

13.8.2 Product Demands

The Sample refinery must supply both products for export and meet the demands in its local area. For these examples, we have assumed the several volume/price relationships as shown in Table 13-12.

Table 13 - 13

SAMPLE REFINERY PROCESSING CAPACITIES

PROCESS UNIT CAPACITIES		
	SAMPLE REFINERY CAPACITY	
PROCESS UNIT	(MB/CD)	KT/YR
CRUDE DISTILLATION	100.0	5000
VACUUM DISTILLATION	41.4	2277
COKER-DELAYED	0.0	0
VISBREAKER	0.7	41
NAPHTHA HYDROTREATER	22.9	984
DISTILLATE HDS	21.0	1024
FCC FEED HYDROFINER	10.4	504
RESID DESULFURIZER	0.0	
CAT REFORMER 150 PSI	24.0	1031
FLUID CAT CRACKER	18.0	888
GASOLINE SPLTR	2.9	125
HYDROCRACKER-DIST.	4.6	227
ALKYLATION PLANT	1.0	35
CAT POLYMERIZATION	0.0	
AROMATICS PLT	0.3	12
PEN/HEX ISOMERIZATION	0.0	
BUTANE ISOMERIZATION	0.0	
LUBE + WAX PLANTS	1.8	91
SOLVENT DEASPHALTING	2.8	145

13.8.3 Refinery Processing Capacities

The nominal operating capacity of each unit for the Sample refinery used in the case study is shown in Table 13 - 13.
The capacities shown are meant to be representative for a European refinery and do not reflect any specific plant.

Table 13 - 14

ECONOMIC SUMMARY SAMPLE REFINERY

ECONOMICS at 64.3% UTILIZATION			
	M$/DAY	MM$/YR	$/BBL
PRODUCT REVENUE	1418.0	517.0	22.05
RAW MATERIAL COST			
CRUDE OIL	941.0	343.0	14.63
GROSS MARGIN	477.0	174.0	7.42
PROCESSING COSTS			
GASOLINE ADDITIVES(TEL)	31.6	11.5	0.49
PURCHASED UTILITIES	9.5	3.5	0.14
OTHER VARIABLE COSTS	10.9	3.9	0.17
SUB-TOTAL PROCESSING	52.0	19.0	0.80
FUEL OIL IMPORTS	35.0	12.7	0.54
GROSS MARGIN(PreTax/Depr.)	390.0	142.3	**6.06**
FIXED COST	190.0	69.4	2.95
NET MARGIN	200.0	73.0	**3.11**

13.8.3 Sample Refinery Economic Summary Report

A brief summary of the economics for the "hypothetical" sample refinery, shown in Table 13-14, indicates the "Gross Margin" before taxes and depreciation is $6.06 for the base case. If fixed costs are included, the margin drops to $3.11.

Table 13 -15

SUMMARY OF REFINERY YIELDS

	BASE CASE	INC. ARAB HEAVY
NET MARGIN,$/BBL	3.11	
CRUDE FLOW,MB/D		15.0
BRENT	7.2	7.5
URALS	45.2	30.0
DUBAI	11.9	12.5
TOTAL	64.3	65.0
PRODUCTS, LV%		
PRM MOGAS	7.8	0
REG MOGAS	22.7	28.0
JET/KERO	10.9	0
GAS OIL	20.2	12.0
FUEL OIL, 1% S	2.0	12.0
FUEL OIL, > 1% S	1.4	36.6
OTHER	31.4	10.0
TOTAL SALEABLE	96.4	98.6

13.8.4 Summary of Refinery Yields

A summary of the major product yields for both the Base Case and a side study for incremental Arab Heavy is shown in Figure 13-15. The yields for Arab Heavy are based on processing an additional volume of 15 MB/D over a base run of 50 MB/D.

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Table 13 - 16

IMPACT OF PRICE INCREASES FOR URALS CRUDE OIL					
	BASE	UP $.70	UP $1.4	UP $2.1	UP $2.8
NET MARGIN, M$/D	198.9	167.35	135.71	104.79	102.06
URALS $/B	16.69	16.69	16.69	16.8	17.5
URALS BBL	45.2	45.2	45.2	35.9	0
DUBAI $/B	15.4	15.4	15.4	15.4	15.4
DUBAI BBL	11.89	11.89	11.89	18.51	37.26
BRENT $/B	17.5	17.5	17.5	17.5	17.5
BRENT BBL	7.2	7.2	7.2	9.93	27.45
ACU FLOW	64.3	64.3	64.3	64.35	64.71
PRM 92 BBL	5	5	5	5	5
REG 88 BBL	14.57	14.57	14.57	14.78	16.04
SUM JET/D2	20	20	20	20.15	20.65
OTHER,BBL	20.2	20.2	20.2	19.62	17.61
FUELOIL 1%S	4	4	4	4	4
FUELOIL >1%S	1	1	1	1	1.21
IMPORT FO 1%S	2.75	2.75	2.75	2.5	1.93
IMPORT FO > 1%S	0.07	0.07	0.07	0	0
VAR. OP.CST	10.94	10.94	10.94	10.96	10.97
LEAD COST	31.64	31.64	31.64	32.08	34.73
OP. CST,CNTS/B	42.58	42.58	42.58	43.04	45.7
NET MARGIN, $/BBL	3.11	2.60	2.11	1.63	1.58

13.9 Example Side Studies

The following sections illustrate a number of planning studies that may be performed in order to balance supply and demand and monitor refinery profitability.

13.9.1 Determine Crude Value (Study 1)

Price increases have been announced for Urals crude oil. What volume would you use if the price increased by $0.70/BBL? What volume would you use if the price increased by $2.80/BBL?

Table 13 - 17

MARGINAL CRUDE SUPPLY ARAB HEAVY					
	BASE	AH +10	AH +15	AH +20	AH+25
NET MARGIN, M$/D	198.9	337.3	405.98	474.46	542.8
ARAB HVY $/BBL	13.9	13.75	13.72	13.67	13.67
ARAB HVY BBL	0	10	15	20	25
URALS $/B	16.69	16.66	16.65	16.61	16.61
URALS BBL	45.2	45.2	45.2	45.2	45.2
DUBAI $/B	15.4	15.4	15.4	15.4	15.4
DUBAI BBL	11.89	0	0	0	0
BRENT $/B	17.5	17.5	17.5	17.5	17.5
BRENT BBL	7.2	12.73	9.17	5.25	2.54
ACU FLOW	64.3	67.93	69.37	70.45	72.74
PRM 92 BBL	5	5	5	5	5
REG 88 BBL	14.57	14.95	14.98	14.94	15.07
SUM JET/D2	20	20	19.48	18.93	18.74
OTHER,BBL	20.22	20.75	20.58	20.35	20.31
FUELOIL 1%S	4	4	4	4	4
FUELOIL >1%S	1	1.91	3.65	5.73	7.77
IMPORT FO 1%S	2.75	1.06	0.79	1.02	0.79
IMPORT FO > 1%S	0.07	0	0	0	0
VAR. OP.CST	10.94	11.17	11.29	11.36	11.56
LEAD COST	31.64	32.44	32.51	32.42	32.71
OP. CST,CNTS/B	42.58	43.61	43.8	43.79	44.27
AVE. CRUDE VAL. $/B		13.84	13.74	13.70	13.67

13.9.2 Refinery Netback Yields (Study 2)

Assume you have the opportunity to buy up to 25 MB/D Arab Heavy crude oil. What price would you be willing to pay for delivery at the crude terminal? Are the product yields per barrel constant over the range of volumes?

Table 13 - 18

PROCESSING AGREEMENT (1-2-4) ARAB HEAVY PLUS MOGAS,GASOIL					
	BASE	AH +10	AH +15	AH +20	AH +25
NET MARGIN, M$/D	198.9	199.2	198.31	196.67	194.8
ARAB HVY,BBL	0	10	15	20	25
SHIP PRM	0	1	1.5	2	2.5
SHIP UNL	0	2	3	4	5
SHIP 2 OIL	0	4	6	8	10
URALS $/BBL	16.69	16.66	16.66	16.64	16.65
BRENT,$/BBL	17.5	17.5	17.5	17.5	17.5
URALS BBL	45.2	45.2	45.2	45.2	45.2
DUBAI BBL	11.89	0	0	0	0
BRENT BBL	7.2	14.67	11.82	8.49	9.85
ACU FLOW	64.3	69.9	72	73.7	80
PRM 92 BBL	5	5	5	5	5
REG 88 BBL	14.57	12.21	12	12	12
SUM JET/D2	20	16.57	14.46	12.05	11.32
OTHER,BBL	20.22	21.05	20.88	19.76	19.49
FUELOIL 1%S	4	4	4	4	4.34
FUELOIL > 1%S	1	1.57	3.63	5.63	8.74
IMPORT FO 1%S	2.75	0	0	0	0
IMPORT FO > 1%S	0.07	0	0	0	0
VAR. OP.CST	10.94	11.38	11.67	11.97	12.75
LEAD COST	31.64	31.11	32.87	35.07	37.28
OP. CST,CNTS/B	42.58	42.49	44.54	47.04	50.03
BRKEVEN FEE,$/BBL		**-0.03**	**0.18**	**0.33**	**0.37**
NET MARGIN, $/BBL	3.11	2.85	2.75	2.67	2.44

13.9.3 Processing Agreements (Study 3)

Assume you have received a proposal for a processing agreement in which Arab Heavy Crude Oil would be processed by your refinery in exchange for Gasoline and No. 2 Gas Oil. The yields are negotiable. Consider the following two options. Which option should you strive for?

Supply	Volume, Option A	Volume, Option B
Arab Heavy	1.0	1.0
Premium gasoline	0.1	0.1
Low Lead Gasoline	0.2	0.2
No. 2 Gas Oil	0.4	0.3
Total	0.7	0.6

Your refinery keeps the fuel oil and other products. What is your break even processing fee for each option?

Table 13 - 19

PROCESSING AGREEMENT (1-2-3) ARAB HEAVY PLUS 1 PRM, 2 UNL, 3 DIST.					
	BASE	AH +10	AH +15	AH +20	AH +25
NET MARGIN, M$/D	198.9	220.2	230.0	239.1	247.8
ARAB HVY,BBL	0	10	15	20	25
SHIP PRM	0	1	1.5	2	2.5
SHIP UNL	0	2	3	4	5
SHIP 2 OIL	0	3	4.5	6	7.5
URALS $/BBL	16.69	16.66	16.67	16.64	16.65
BRENT,$/BBL	17.5	17.5	17.5	17.5	17.5
URALS BBL	45.2	45.2	45.2	45.2	45.2
DUBAI BBL	11.89	0	0	0	0
BRENT BBL	7.2	14.68	9.21	8.49	10.04
ACU FLOW	64.3	69.9	69.4	73.7	80.2
PRM 92 BBL	5	5	5	5	5
REG 88 BBL	14.57	12.21	12	12	12
SUM JET/D2	20	17.57	15	14.08	13.92
OTHER,BBL	20.22	21.05	20.4	19.72	19.5
FUELOIL 1%S	4	4	4	4	4.35
FUELOIL > 1%S	1	1.57	3.68	5.61	8.75
IMPORT FO 1%S	2.75	0	0.78	0	0
IMPORT FO > 1%S	0.07	0	0	0	0
VAR. OP.CST	10.94	11.38	11.39	12	12.8
LEAD COST	31.64	31.11	32.87	35.07	37.28
OP. CST,CNTS/B	42.58	42.49	44.25	47.07	50.07
BRKEVEN FEE, $/BBL		**-2.13**	**-1.97**	**-1.82**	**-1.75**
(A (-) MEANS INCREASED PROFITS TO REFINER)					
NET MARGIN, $/BBL	3.11	3.15	3.31	3.24	3.09

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