

Comparative Study of Exchange Traded Energy Products Worldwide and Potential Areas in India

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ABSTRACT:

The globalization of trade in Indian economy and relatively free movement of financial assets, risk management through derivatives products has become a necessity in India. Until the 1970s, the price of oil was relatively stable with production largely controlled by the biggest oil companies. The 1970s transformed the industry forever. Two oil price shocks meant that price volatility became a fundamental feature of the market, short-term physical markets rapidly evolved, and the need to hedge emerged. India is one of the non-OPEC countries much dependent on its imports to fulfill the domestic consumption demand as it has a much lower level of production. India is a developing country and the requirement for the oil as a primary energy constituent from the industries in the country is at its peak. By systematically examining and analyzing both information collected through this research in major countries with key figures of the oil prices in trading exchange, and a wide range of information that is in the public domain, this paper foresees trends in exchange traded energy products, prices, and presents actions that India should initiate.

Keywords: crude oil trade, exchange platform, contract specifications, price volatility, oil prices.

I. INTRODUCTION

1.1 COMMODITY MARKETS

On July 3rd, 2008, Brent crude oil futures were trading at 146 US dollars per barrel. The TD3 Arabian Gulf Japan shipping route was quoted at 240 World scale, and analysts were predicting crude prices at 200 dollars within the next months. On December 3rd, Brent traded at 45US\$ per barrel and TD3 at 70 World scale, drops of 69 and 71% respectively.

The commodity markets are among the most volatile in the world, and there volatility is a source of both profit and risk for the actors involved. In order to manage these risks the physical spot markets have from an early stage been accompanied by forward market, later transforming into financial derivatives markets. The Chicago Board of Trade introduced exchange- traded futures contracts on agricultural product in 1848, and crude oil was traded forward from its beginning in the 1860s (Yergin, 2008).

Most modern commodity market consists of two intertwined markets: the physical and financial market. The physical – or spot – market is made up of all market participants selling or taking delivery of the commodity product. In the crude oil market these are oil companies, refiners and physical trading

companies. Trading in the spot market usually occurs through broker, matching sellers and buyers of cargoes at specific dates and location.

The financial commodity market is the market for derivative contracts based on the spot. These derivatives take the form of forwards, futures and options, and are used for risk management by companies involved in the physical market and speculation by other players. Importantly, the derivatives settle against the physical market, there by linking the two. In some cases the derivatives are physically settled, i.e. the buyer receives the actual commodity. In other, the derivatives settle financially against a spot index published daily based on transactions in the physical market.

The relative volumes of financial and physical markets depend on the level of development of the derivatives market. In 2009, the volume of derivatives (futures and options) traded on crude oil was 303 billion barrels, compared with an annual world production of 33 billion barrels (CIA, 2009), making the derivatives market nine times the size of physical market. In tankers shipping, derivatives market traded 304 million tons of oil cargo in 2009, compared to 145 million tanker deadweight tons traded spot in 2006 (Stop ford, 2009), which evaluates the size of derivative market, which will happen through standardization and changes in the convection for physical price setting , similar to what has occurred in the oil market since the 1980s.

Modern commodity exchanges date back to the trading of rice futures in the 17th century in Osaka, Japan, although the principles that underpin commodity futures trading and the function of commodity markets are still older. The first recorded account of derivative contracts can be traced to the ancient Greek philosopher Thales of Miletus in Greece, who, during the winter, negotiated what were essentially called options on oil presses for the spring olive harvest. The Spanish dramatist Lope de Vega reported that in the 17th century options and futures were traded on the Amsterdam Bourse soon after it was opened.

Derivatives' trading is a natural application to the problems of maintaining a year-round supply of seasonal products like agricultural crops and in price risk management of energy products like crude oil. Exchanging traded futures and options provide several economic benefits, including the ability to shift or otherwise manage the price risk of market or tangible positions. With the liberalization of trade in many countries, and the withdrawal of Government support to producers there is a new need for price discovery and even physical trading mechanisms, a need that can often be met by commodity exchanges. Hence, the rapid creation of new commodity exchanges, and the expansion of existing ones have increased over the past decade. At present, there are major commodity exchanges in over twenty countries, including the United States, the United Kingdom, Germany, France, Japan, the Republic of Korea, Brazil, Australia and Singapore. A large number of brand new exchanges have been created during the past decade in developing countries, but many of them have disappeared.

1.2 US CRUDE OIL:

There are several grades of domestic and internationally traded foreign crudes and each serve the diverse needs of the physical market. Light, sweet crudes are preferred by refiners because of their low Sulphur content and relatively high yields of high-value products such as gasoline, diesel fuel, heating oil, and jet fuel.

Crude oil is the world's most actively traded commodity and the NYMEX Division light, sweet crude oil futures contract is the world's most liquid forum for crude oil trading, as well as the world's largest-volume futures contract trading on a physical commodity. Because of its excellent liquidity and price transparency,

the contract is used as a principal international pricing benchmark. The contract trades in units of 1,000 barrels, and the delivery point is Cushing, Oklahoma, which is also accessible to the international spot markets

1.3 CRUDE MARKET INFLUENCES

As with all commodities that are readily supplied by several countries, crude oil can tend to either be in over supply or short supply. When there is a short supply, prices bid up to the highest that the market sustains. When supply is ample, prices sink to the lowest that producers will accept. There is no happy middle ground. That is why commodity prices (not only oil, but cocoa, metals, etc.) are "volatile" and why it is so easy to lose your shirt in commodities trading.

So along with traditional supply and demand economic issues, there is also an incredible incentive to manipulate the market for a commodity. For example, every time OPEC (Organization of the Petroleum Exporting Countries) gets together and discusses cutting production, oil prices go up. If Iran pursues an atomic bomb and openly announces every milestone in their program, oil prices go up. The knock on effect is that products made with oil, copper or silver get more expensive, manufacturers pass on the higher costs, prices among goods and services re-adjust, and life goes on.

On average, more than 87 million barrels of crude oil and natural gas liquids are traded every day. This number is expected to grow substantially as demand increases mainly in the developing countries, especially Asia, in response to expanding populations and rapidly growing economies. This, however, may be partially offset by conservation efforts and a flight to alternative energy forms in the developed world.

The trading of crude oil from one party to the other can take place at various points along the petroleum value chain, but crude sales usually occur upstream near the point of production (the first "liquid market").

Crude oils, like other commodities, are bought and sold through a variety of contract types, including "spot" transactions. These arrangements serve either of two purposes:

- To transfer the title and possession of the physical crude oil from the producer to the buyer -- a refiner or trader, and
- To manage the financial risks involved in trading a commodity that is subject to daily price fluctuations

Physical and **price management** markets for crude oil have developed under different circumstances over the past century. Oil companies, traders and financial institutions may utilize these two different markets either to transfer the ownership of the physical oil or to manage prices. The decisions of which contract to use depend on many factors, which we will examine in this module.

The **physical oil market** exists for the sole purpose of delivering and receiving physical oil. Contracts are normally non-standard, and title and risk in the oil is transferred from one party to the other at a specified time and location. For crude oil, the physical market is global and globally competitive. Refiners source crude oil globally and producers compete for their business, creating a truly competitive marketplace.

The **price management** (or financial) market developed out of necessity in the 1980s as a means to counteract falling prices, and then to manage price volatility. Hedging is the basic tool to protect against

the risk of falling commodity prices, and oil companies and investors developed a set of contracts that fulfilled the need for hedging instruments for crude oil. Hedging also protects against rising prices and price volatility over time. Nowadays, there are a range of contracts available to fulfill a variety of price management and speculative functions. These include futures, forwards, swaps and options.

In this module, we trace the development of the crude oil market from the time it was dominated by the major oil companies, through the turmoil of the 1970s and 1980s to the market that exists today. We then examine the arrangements by which oil is priced and traded in the physical market, culminating in examples of real world trades. Finally, we explore some of the ways in which buyers and sellers manage risk using the **price management** contracts.

II. BACKGROUND OF THE STUDY

2.1 A commodities exchange is an exchange where various commodities and derivatives product are traded. Most commodity markets across the world trade in agricultural product and other raw material (Like wheat, barley, sugar, maize, cotton, cocoa, coffee, milk product, pork bellies, oil, metals, etc.) and contracts based on them. These contracts can include spot prices, forwards, future and option on futures. Other sophisticated product may include interest rates, environment instrument, swaps, or ocean freight contracts.

Commodity markets are markets where raw or primary products are exchange. These raw commodities are traded on regulated commodity exchanges, in which they are bought and sold in standardized contracts.

2.2 STATEMENT OF THE PROBLEM: Commodities market is the place where people can still earn the profit even if there is downfall in the price of the commodity. The major problem is that people do not have enough knowledge about commodity exchange. They do not know how they function and risk associate with the exchange.

The commodity exchange established in the country is Mercantile Commodity Exchange Limited (MCX). There are many areas where the commodity exchanges need to work on. Some problem in commodity exchange there is proper governance, lack of warehouse, etc.

2.3 OBJECTIVE OF THE STUDY: The primary objective of the study is to gain knowledge of the commodity market. The secondary objectives of the study are listed below:

- To give insight about commodity exchange.
- To make comparison between exchange system globally.
- To know market conditions for the crude oil trading.
- To examine and analyze the scope of trading opportunities available among exchanges.

III. METHODOLOGY

3.1 Study approach

The study is purely based on the exploratory design finding the answer of research questions. The problem is properly diagnosed through exploring as much information as possible through different areas. An exploring research was conducted to get the information. Judgment method used to identify the sample element for collection of data.

3.2 Sources of the Information

Primary sources of the information were used in the study. Data collected through the research were the main source of information. Besides that literature survey and Secondary data from the newspapers and websites were used for further analysis of the commodity exchange.

In this study we have taken five commodity exchanges i.e. Newyork Mercantile Exchange, Intercontinental Exchange, Tokyo Commodity Exchange, Multicommodity Exchange and Dubai Gold commodity Exchange. All these exchanges are geographically located in different time zones as Tokyo is in far east and as we moving towards west Mumbai, Dubai, Mumbai and Newyork are coming. Contract specification and Market volume has been used to compare these commodity exchanges. WTI crude oil is being used as one energy product whose contract specifications are being used for comparison.

3.3 WORLD COMMODITY EXCHANGES AND DIFFERENT TYPES OF ENERGY PRODUCTS

Name of Exchange	NYMEX (New York Mercantile Exchange)	ICE London (Inter Continental Exchange)	TOCOM (Tokyo commodity Exchange)	MCX (Multiple Commodity Exchange)	DGCX (Dubai Gold and Commodity Exchange)
Country	New York(US)	London(UK)	Tokyo(Japan)	Mumbai(India)	Dubai(UAE)
Energy Traded Commodity	Crude oil, Natural Gas, Ethanol, Refined Products, Electricity, Coal, Uranium	Brent Crude, WTI Crude, Electricity , Natural Gas, Coal	Gasoline, Crude oil, Gas Oil, Kerosene, Chukyo Gasoline, Chukyo Kerosene	ATF, Brent Crude Oil, Crude Oil, Imported Thermal coal, Heating oil, Gasoline, Natural Gas	Fuel Oil , Brent Crude oil, WTI Crude oil

Nymex is the biggest and most sound energy commodity exchange among all. Wide variety of energy products are available for trading on this platform. Even electricity and uranium are also traded on this exchange. In Asia pacific region Tokyo commodity exchange is most popular and has a wide variety of contracts available to trade on this platform. On MCX, in India, trading is being done in different energy products but within one product there are not much options available.

3.4 COMPARISON OF CRUDE OIL TRADING ON DIFFERENT EXCHANGE PLATFORMS

	NYMEX	ICE London	TOCOM	MCX	DGCX
Contract Size	1000 US barrels	1000 bbl	50 KL (approx 3145 barrels)/contract	100 bbl/contract	1000 Barrels
Price quote	U.S dollar and Cents per barrel	US \$ per barrel	Yen per kiloliter	RS. Per barrel	USD and Cents per barrel

Trading day	Monday to Thursday	Monday to Friday	Monday to Saturday	Monday to Saturday	Monday to Friday
Trading hours	2:00pm to 07:30 pm GMT	01:00 A.M. – 23:00 P.M. GMT	00:00 am to 06:30am GMT 08:00 am to 07:00 pm GMT	Monday to Friday 04:30am - 06:00pm Saturday 04:30 am- 08:30 am GMT	03:00am - 07:30pm GMT
Maximum Order Size	500	300	2400	100	500
Initial Margin	3053-6178	3290 - 4700	67000 – 1 million yen	5% per lot	3500-4300 \$/contract
Extra Margin	-	Market to market on daily basis	-	15%.An additional margin and special margin at such percentage, as deemed fit, will be imposed in respect of all outstanding period.	At times of high volatility, an extra margin, as deemed fit by the Exchange, may be charged
Settlement		Brent index price for the day is the last trading day of the future contract.	A business day following the Last Trading Day of the current contract month.	1 st and 2 nd working day after expiring of the contract.	A business day following the Last Trading Day of the current contract month.
Expiry Date		Trading shall cease at the close of business on the business day immediately preceding the 15th.	Day session on the last business day of the current contract month.	1 st working days after expiring of the contract after 6 th month.	Last Day of Trading shall be the second UK business day immediately preceding

					the 15th day prior to the first day of the Delivery Month
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In this table, comparison of contract specifications of crude oil contracts has been done. As it is known to everyone that an exchange traded derivative product (futures & options) is a standardized contract in terms of price, quality, quantity and time. Contract size is equal in DGCX, NYMEX and ICE with 1000 bbl/contract but in MCX, one contract is of 100bbl and in DGCX it is of approx. 3145 bbl. Maximum order size is highest in TOCOM with 2400 contracts at a time while MCX has the lowest with 100 contracts at a time.

3.5 TRADING INSTRUMENTS AVAILABLE

NYMEX	DGCX	ICE	MCX	TOCOM
Futures, Options, Swaps	Futures	Futures, Options Swaps	Futures & Options	Futures and Options

In NYMEX and ICE all types of derivative contracts are available for trading and in DGCX only future contracts are available.

3.6 VOLUME OF CRUDE OIL IN DIFFERENT EXCHANGES

	NYMEX	ICE	MCX	DGCX	TOCOM
2015	22356898	51102873	13938813	648399	755520
2016	23768967	46412230	20507001	635290	624307
2017	21546754	52789730	41092821	712839	943450
2018	22896547	51935636	41537053	702273	1297512
2019	23906754	31216016	57790229	789012	1285388

3.7 OPPORTUNITIES FOR DIFFERENT MARKET PARTICIPANTS

There is very good arbitrage opportunity available for the traders. There may be opportunity for netting more profits in crude oil futures. Indian companies, with an arm in Dubai, can now keep an eye open for arbitrage between Mumbai-based MCX and Dubai Gold and Commodities Exchange (DGCX), the top exchange in the Middle East. DGCX on Tuesday launched cash-settled West Texas Intermediate light sweet crude oil and Brent crude oil futures contracts. Both contracts appear to be a runaway hit with local punters as DGCX recorded its highest first-day volumes exceeding \$370 million.

Crude is also the most popular contract on MCX. More than 29,000 lots of the June contract were traded today, with the gold June contract a distant second at 18,533 lots. Indian companies that are trading on MCX and have a subsidiary that trades on DGCX can use the slight price difference in crude oil contracts on the two exchanges, which is created largely by the dollar-rupee exchange rate, to make risk-free profits at the end of day.

Both the exchanges can use the same New York price to settle their contracts. So a company can buy the contract where it is relatively underpriced and sell immediately in the other market. The profit can be booked by either the Indian company or its Dubai subsidiary. Unlike normal speculation, arbitrage is a financial transaction which gives immediate profit without involving any risk.

The launch of both WTI and Brent Crude Oil futures on DGCX makes the world's two most significant crude oil benchmarks available to both regional and international market participants, allowing them to benefit from trading and clearing transactions under the UAE regulatory and taxation regimes, they added. Each DGCX crude oil futures contract is sized at 1,000 barrels, with the contract price quoted in US dollars and cents per barrel.

The minimum price fluctuation is one cent per barrel, equivalent to a tick value of \$10.00. Light, sweet crude are preferred by refiners because of their low sulphur content and relatively high yields of high-value products such as gasoline, diesel fuel, heating oil, and jet fuel.

WTI, also known as Texas Light Sweet, is a type of light crude, lighter and sweeter than Brent Crude. Its properties and production site makes it ideal for being refined in the United States, mostly in the Midwest and Gulf Coast regions.

IV. LIMITATIONS OF THE STUDY

There were certain limitations faced in the research period which has in some or the other way made impact in the conclusion of this report. These limitations are listed below:

- In-depth and comprehensive study of the workings in the field of commodity exchange could not be done due to different practices in commodity Exchange Company.
- Data is limited to the research and interview. Details information about the working of the future market also could not get due to the security and privacy reasons.
- Customers are not fully aware of the working of commodity exchange since their business is supervised by the broker. Due to this, Data collection was difficult.
- The access to the complete information was not possible due to the time and resource constraint. So the study was conducted in a limited sample size.
- The past data regarding the price change in commodity is not available due to the frequent change in its price and few exchanges are giving paid data services.

V. CONCLUSION

The research was conducted with an objective to give insights about the different commodity exchanges worldwide. In the past few years of establishment, commodity market has grown rapidly. The crude oil which is traded on different exchanges platforms of different-2 specifications is available for trading to the different market participants (investors, hedgers, arbitragers and speculators) depending on their objectives and requirement.

New York Mercantile exchange is biggest exchange in terms of volume and variety of contracts available for trading followed by Intercontinental exchange, London. Indian commodity exchange, MCX, is comparatively a small platform available to different market participants.

In Dubai gold commodity exchange only cash settlement option is available and in other commodity exchanges both options of delivery and cash settlement are available.

We can infer from volume of trade and contracts data that crude oil trading in other countries is in mature stage while it is in preliminary stage in India.

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