

An Analysis of Crude Oil Trading on Exchange Platform and Potential 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. In this research paper, our objective is to gain knowledge of commodity trading of energy products with special emphasis on crude oil. Our main aim is to do the comparative analysis of different well established commodity exchanges worldwide. This research covers a worldwide popular trading exchange platform which shows trading of crude oil in major countries with respect to India. 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, infrastructure, oil prices.

INTRODUCTION TO OIL MARKET

Energy is very important for economic growth of a country. India is the fourth largest consumer of energy in the world, fourth in the list of top energy consuming nations and it is being projected that at this speed it will be left behind Japan by 2021 which is right now third in the world list (Source: EIA).

India has only 0.4% of the world's reserve of hydrocarbon. India, like other developing nations, imports more than 25 percent of primary energy needs for its uses in the form of crude oil & natural gas. Crude Oil accounts for 34 % of total primary energy consumption in the year 2007-08 in India. India's per capita consumption of oil is amongst the lowest in the world with only 277 Kg of oil equivalent per capita compared to World's average consumption is 1480 Kg of oil equivalent per capita. India had 5.5 billion barrels of proven oil reserves as of December 2007, the third largest in the Asia-Pacific region. India's have light and sweet crude oil reserves, with specific gravity varying from 38° API in the offshore Bombay High field to 32° API at other onshore basins. Much of India's crude oil reserves are located off the western coast (Mumbai High) and in the northeast of the country, although substantial undeveloped reserves are located in the offshore Bay of Bengal and in Rajasthan state. India's oil import dependency is projected to increase from the current level of 73% to over 90% by 2030 (source: Integrated Energy Policy report, Planning Commission, 2006). International oil prices have a critical bearing on the domestic pricing of petroleum products.

Crude oil is by far the most influential commodity in the world and it has recently affected many countries around the world India too. Rapid rise in crude oil prices hamper economic growth not only in India but also in many other countries as well. As crude prices in global markets touched \$145, adverse effects of it has also been realized by Indian economy and few days back double digits rate of inflation. A study by IMF has estimated that every \$10/bbl increase in oil prices results

in a decrease of GDP by 0.5% in developed countries, 1% in developing countries like India and more than 3% for underdeveloped countries. Furthermore, oil prices do not affect only countries, but individuals also as crude oil prices have a direct impact on gasoline, gas and heating oil price. When designing an energy price risk management or trading program, it is essential to be aware of all the risks that are involved in the energy market and the ways in which they interrelate.

Reasons for Volatility and Why Risk Arises in Crude Oil Market

- Decision taken by OPEC, production and supply
- Global demand and supply imbalance. Global demand particularly from emerging nations
- Geopolitical factors that cause supply disruptions
- Weather/storms condition
- Terrorism, war and any other unforeseen
- Political tension between countries
- Comments from country leaders
- Shipping problem - transportation
- Changes to tax and duty structure
- Currency fluctuations

DOLLAR IMPACT -weaker dollar drives crude oil prices higher

Seasonality –US Summer driving, winter season and Hurricane season. International Politics related to favoring and banning by OPEC countries and other Oil major countries.

The Organization of Petroleum Exporting Countries (OPEC), with has 76% of total share of world oil reserves and accounts for 40% of the world oil production and other oil producing countries which have the maximum production influence the oil market by increasing or decreasing oil production. As this cartel is very effective, as they decide a price band of their crude basket. For example - The OPEC cartel to keep prices high in the 1970s and 1980s

Inventory reserves - Inventories are needed to match supply & demand and uncertainty over price changes (volatility) depends on the gap between demand and supply Changes in inventory levels can be used to reduce the difference between supply and demand and thus and control the price volatility.

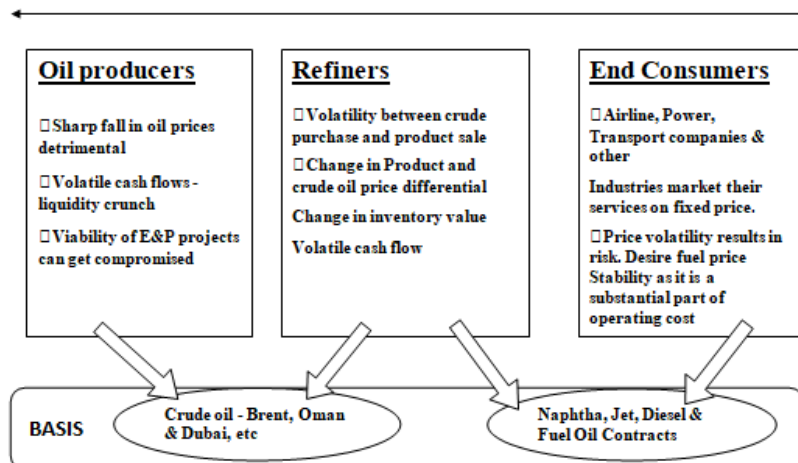
Risk:

Risk can be define as a chance or a probability of an occurrence from an actual outcome from an investment, it impact can be either ways positive opportunity or negative thread in trying to achieve a current objective.

In other words it is a likelihood that an undesirable scenario will occur of loss or less than excepted returns.

Risks faced by Companies/End users due to crude oil price volatility

India imports about 75% of its oil demand -International oil price volatility cannot be wished away. All players exposed to price volatility.



Basis: - Companies across the spectrum face significant risks –Highlights the need for hedging.

Who is affected by this volatility?: Directly indirectly each & every sector is affected by the volatility in Prices of Crude oil. Directly, It affects Oil exploration & production companies, Oil Marketing companies, Aviation sector and indirectly it affects Pharmaceutical sector,

Sectors directly affected by crude price volatility

- Oil Producing Companies
- Oil Marketing Companies
- Aviation - airlines business
- =Manufacturing and Construction industry
- =Pharmaceuticals Sector

Besides the above sectors, other sectors like agriculture are also affected by volatility in crude prices as it let to the cost of irrigation and transportation. To safeguard against this volatility a corporate needs to integrate the mechanism of hedging in order to lock in cash flows (both in and out)

RISKS IN CRUDE OIL TRADING



**TYPES OF RISKS:-
 FINANCIAL RISKS**

Price risk

This is the risk of loss financial in nature due to decline in price of physical commodity or security by the price movement in the energy market. It is also referred as market risk as based on market fluctuations and movement.

Due to it, if the prices rise end user will lose money, where as if prices fall producer lose money.

For Example- BPCL hedges it refinery margins in the OTC swap market. The product cracks hedged are Naphtha, HSFO, Kerosene, and Gasoil. Counterparties involve are Banks, Traders and Majors oil companies.All deals are done through tender. Tender invitations are only sent to counterparties who are registered with BPCL and have signed ISDA (International swaps and derivatives association).

Price volatility -Crude oil prices decline from \$147.27 and witness below of \$32.40 and currently hovering around \$50.00 levels

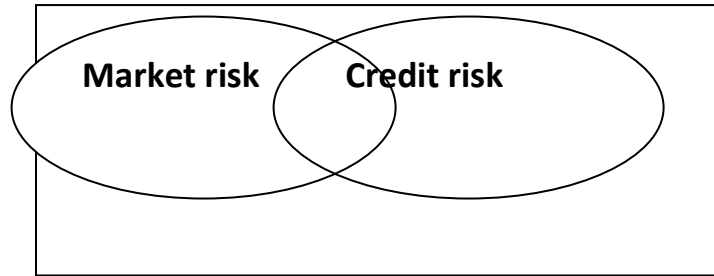
Liquidity risk

This risk of loss arises when a party who wants to trade in cannot do so because no other counters party is ready to do so in those assets with him. As derivatives market becomes illiquid. Liquidity is very important for the party who is holding an asset as it will affect its ability to trade. This happens due to high volatility in the market, it's possible that many banks and oil trader will not offer any bid or offer price. (As it happens during the gulf war) In this situation companies are not able to clear out their position and can only do so causing them great loss.

Credit risk

It can be define as the financial loss due to the potential counter party to the contract defaulting and due to uncertainty in counterparty's ability to meet its obligations as per the terms and conditions agreed upon in the contract. The reliability of a hedging contract depends on the credit standing of the counterpart.

Intersection of market risk and credit risk



Market risk and credit risk are interrelated as credit worthiness of a country party also depends on market situation up to a certain limit.

Cash flow risk

This is the risk that an organization will not be able to produce the cash to meet its derivatives obligations. Take a case Suppose an Indian Refinery had been hedging against movements in the gasoline price by using derivatives denominated in dollars. Suddenly rupee fell in value against the dollar; the company found that the cost of the dollars needed to service its derivatives contracts had soared. The company lost out because it had not hedged against the risk of a negative movement in the currency differential between the rupee and the US dollar.

THE PERILS OF LIQUIDITY AND CASH FLOW RISK: A PRACTICAL EXAMPLE

A practical example to show what could be the effects on a refinery if it does not hedge its position appropriately. In 1993 the German conglomerate Metallgesellschaft AG announced that its Refining and Marketing Group (MGRM) had been responsible for huge losses of around \$1.5 billion, which it had incurred by writing oil futures contracts on the New York Mercantile Exchange (NYMEX). The great irony of the situation was that its position had been perfectly sound from an economic point of view. The company's difficulties stemmed from the fact that it had ignored the perils of liquidity and cash flow risk.

In the early 1990s MGRM agreed to sell 160 million barrels of oil at a fixed price at regular intervals over a ten year period. At the time this kind of forward contract looked like a lucrative strategy; as long as the spot price for oil remained lower than the price that MGRM had fixed, the company was sure to make a profit. However, it was vulnerable to a rising oil price, so it hedged this risk using futures contracts. Now, if the oil price rose it would lose on its fixed price forward contracts, but gains on its futures. If the price fell, it gained on the forward contracts, but lost on the futures. This appeared to adequately hedge MGRM's price risk, but unfortunately failed to take account of its liquidity and cash flow risk.

One of MGRM's problems was the sheer size of the position it had taken. The 160 million barrels of oil that it had committed to sell were equivalent to Kuwait's entire production over an 83 day period. It has been estimated that the number of futures contracts needed to hedge the position would have been around 55,000. NYMEX was known to be a large and liquid market, but its trade in contracts relevant to MGRM's position averaged somewhere between 15,000 to 30,000per day. There was thus a clear theoretical risk that MGRM could have problems liquidating its futures position. This risk created an imbalance in the market as many other players realized the size of MGRM's position which became in it a factor in market pricing. Prices inevitably began to move against the company.

This liquidity risk was compounded by the cash flow risk which resulted from the way that MGRM's hedge had been structured. As was noted earlier, when oil prices went down, the value of the company's fixed rate forward contracts rose and the value of the futures fell. The problem arose because although the forward contracts increased in value, they did not generate the cash flow which was needed to fund the regular margin calls that were due on the futures contracts. The structure of the hedge had succeeded in dealing with price risk over the life of the hedge but had failed to deal with cash flow risk in the short term. This was probably the major factor in the staggering losses that the company suffered (Energy Price Risk 2003).

Basis risk

In every market, price depends on delivery location, delivery period, and quality. Basis Risk is the risk that the price of the hedging instrument will not move exactly in line with that of the physical commodity. Anything less than perfect correlation between the hedging instrument and the physical commodity introduces basis risk.

Basis risk means risk of loss arise when setting off investments in a hedging experience a price change in entirely different direction from each other.

In price risk management, basis risk describes the risk that the value of a hedge (using a derivative contract or structure) may not move up or down in sync with the value of the price exposure that is being managed. (Tom james)

Basis risk is the risk of loss due to an adverse movement (upward or downward) of expected differentials between two prices (usually different products). In the context of price risk management, basis risk describes the risk that the value of a hedge (using derivative contract or structure) may not move up or down in sync with the value of the price exposure that is being managed (Hull 2006).

This imperfect correlation between the two investments brings excess gains or losses in a hedging strategy, thus adding risk to the position.

Some situations in which basis risk can occur are:

- Physical material at one place cannot be transported and delivered to another location having shortage.
- When there is not enough time to transport or produce an energy product to a market having shortage of that product.
- At the time of shortage energy product with different cannot be substituted by a product with different quality.
- These situations may arise due to poor whether condition, change in regulations or political situations.
- In the price risk management the lesser the basis risk, the more useful the derivative is for risk management purpose.

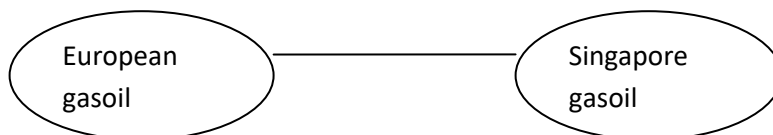
The advantage of OTC swaps and options over future contract is that basis risk can at times be zero in OTC swaps and option, as OTC contracts can often price against the same price reference as the physical oil. Whereas futures contracts traded on exchanges like ICE Futures, NYMEX or Tokyo Commodity Exchange all have their pricing references and terms fixed in the exchange's regulations.

This means that if their pricing reference does not match the underlying physical exposure, the basis risk must either be accepted or an OTC alternative needs to be sought.

Components of Basis Risk:

Location Basis

One will have location risk if it utilizes a derivatives contract which prices against exactly the same specification of energy, we are hedging. However the derivatives contract is priced against the same energy contract but in a different geographic region. For e.g. European Gasoil and Singapore Gasoil using a derivative contract price against the same specification of energy (we are hedging price risk against) but in a different geographical region.



Time basis

In Energy markets a time basis risk occur when there is a sudden shift in demand or transportation problem is there. This can be cleared with an e.g. If we are expecting stronger heating oil prices in the winter time (as it is use for heating purpose due to extreme cold) and hedges our position by buying the December contract in NYMEX division New York harbor

heating oil future. If a severe cold wave was to arrive early in winter, say in late October, then the price of November heating oil may become much stronger than the December price i.e. December heating oil futures may not give adequate price risk cover against the November heating oil requirement.

Mixed Basis risk

Mixed basis risk occurs when an underlying position is hedged with more than one type of mismatch between the energy that is the subject of the price risk management and the pricing index reference of the derivatives instrument that is being used. For example, if an January natural gas shipment is hedged with an march Jet Kerosene swap, it would leave both time and product basis exposures.

Legal Risk:

This is the risk of loss if derivatives contracts may be not be enforceable due to certain circumstances. Some common reason in this area is clauses on netting of settlements, netting of trade, bankruptcy and the liquidation of contracts may be unenforceable. Example: - Failure to comply with regulations. It is also known as regulatory risk as it occurs due to changes in Governance policies and regulations and affects the trade.

Tax Risk:

Tax risks are there when there are changes in tax laws and regulations that could affect payment under an agreement, either the derivatives market directly or the physical underlying energy market in some way and this can create additional costs to the trade. Example: - Tax non compliance.

Operational Risk

The risk which may occur through the errors or omissions in the operation of clearing, processing and settlement of derivatives is known as operational risk. For e.g- misunderstood of date, quantity, specifications, wrong posting of figures or communication gap during a deal or over an operation, data entry error, Reporting error, Calculation error, incomplete legal document. Risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems of external events

Excludes “Business Risk” and “Strategic Risk”

Operational Risk also includes -

Risk premium on inventory assets - This is a part of operational risk which occurs if there is a negative price as crude is store as a part of trading change. So it puts a question that to store it or not.

Foreign currency risk or Exchange rate risk

Risk of loss a business or an investment may suffer due to an adverse movement in foreign exchange rates. For example, if money must be converted into a different currency before making a certain payment or investment, changes in the value of the currency relative to the American dollar will have a affect on the gain or loss on the investment when the money is converted back. This risk usually affects businesses, but it can also affect individual investors who make international investments. It is also called exchange rate risk.

In simple words Currency risk arises from the change in price of one currency against another. It occurs when investors or companies have business operations across country boundaries, they are at currency risk if their positions are not hedged. Exchange /Transaction risk is the risk that exchange rates will change unfavorably over time during the business deal or before settlement. It risk can be hedged against using forward currency contracts.

It's important because crude oil trading is affected by it:-

-Oil producing countries receive their oil payments in US \$ dollar.

-As US Dollar is the currency of choice in global crude oil market.

Dollar depreciation reduces activities of investments in upstream due to increase in cost, lower ROI (return on investment) lower PP (purchasing power).Consumers use local currencies to buy petroleum products

Decrease in value of US \$ led to high demand of oil, in oil importing countries as the value of their currency appreciated & increase in purchasing power.

Uncertainties or unforeseen like war (gulf war) - The crude oil trading is also effected by major events and unforeseen events like wars and tension between major oil producing country or traders like importers or exporter. Result in production

loss and cut in supply of oil leading to high volatility in prices and oil crises. Such crises occur during the gulf war, when the oil prices rises more than anticipated and the market become very volatile.

On July 3rd, 2008, Brent crude oil future 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 consist of two inter link edmarkets: 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 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 springolive 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.

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

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 (Organisation 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 programme, 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.

Background of the study

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.

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. There are two commodity exchange established in the country namely commodity and Metal Exchange Nepal Limited (COMEN) and Mercantile Exchange Limited (MEX). 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.

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.

METHODOLOGY

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. 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. For the collection of data we visited the site, news channel, magazines and newspapers. Also I interviewed with the professionals, experts of future market, staffs of the commodity exchanges and faculty members of our university to review the mechanism of commodity exchanges. Therefore, the data used while preparing this report is both primary and secondary.

Comparison of Crude oil trading on different exchanges 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			100	500
Initial Margin		3290 - 4700		5%	3800-4300 \$/contract
Extra Margin					At times of high volatility, an extra margin, as deemed fit by the Exchange, may be charged
Settlement			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.		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

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, Brunt Crude Oil, Crude Oil, Imported Thermal coal, Heating oil, Gasoline, Natural Gas	Fuel Oil , Brent Crude oil, WTI Crude oil

Volume of Crude oil in different exchanges

	NYMEX	ICE	MCX	DGCX	TOCOM
2008		51102873	13938813		755520
2009		46412230	20507001		624307
2010		52789730	41092821		943450
2011		51935636	41537053		1297512
2012		31216016	57790229		1285388

Trading Instruments available

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

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 will 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 will 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," said an Indian broker in Dubai.

Meanwhile, DGCX officials told ET, the two contracts contributed more than 45% of the exchange's daily volume on the first day of trading. "Opening day trade surpassed all previous DGCX records with over 2,800 contracts traded on WTI and Brent, outshining silver futures' first day volumes of 1,158 contracts in March 2006," they said. 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.

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 specifications is available for trading to the different market participants (investors, hedgers, arbitrageurs and speculators) depending on their objectives and requirements. 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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