A STUDY ON PRICE DISCOVERY IN INDIAN COMMODITY MARKET: AN EMPIRICAL INVESTIGATION

Abstract of Thesis

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ABSTRACT

INTRODUCTION

Price discovery refers to the act of deciding, by observing consumer supply and demand and other factors associated with the trade, the proper price of a safe, asset, or products or services. Price discovery is a process by which specific supply and demand considerations relevant to the market decide the price for a given product or security.

Discovery of prices means discovering where supply and demand intersect. The supply curve and the demand curve in economics converge at a single price, which then causes a sale to take place. From transaction size to context circumstances of past or potential scarcity or excess, the form of such curves is subject to several variables. Place, storage, transaction costs and the psychology of buyers/sellers all play a part. Using all these parameters as variables, there is no clear formula. The formula is also a complex mechanism which, if not from trade to trade, can change frequently.

It should be considered to be the core feature of every marketplace, whether it is a financial exchange or the local farmer's market, rather than thinking price discovery to be a 'item' or a particular procedure. The market itself puts together prospective buyers and sellers, with members of each party having very different selling motives and very different styles for doing so. These markets encourage both parties to communicate by encouraging both buyers and sellers to come together, and a consensus price is created by doing so. All the players do it again without understanding it, to set the very next price, and so on.Those parties with the freshest or highest quality information can have an advantage as they can act before others get that information. When new information arrives, it changes both the current and future condition of the market and therefore can change the price at which both sides are willing to trade.

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It is a location where shares are exchanged by publicly listed firms. The main market is where, through an initial public offering (IPO) to collect money, businesses float shares to the general public.

Once new stocks have been issued in the main market, they are exchanged in the secondary market, Where one investor buys shares from another investor at the current market price or whatever price that the buyer and seller agree on. The secondary market or the stock markets are regulated by the regulatory body. In India, the Security and Exchange Board of India controls the secondary and main markets (SEBI) (SEBI).

A stock market allows the trading in business stocks and other shares through stock brokers. Only if it is listed on an exchange can a stock be purchased or sold. It is, thus, the meeting place of the buyers and sellers of stocks. The Bombay Stock Exchange and the National Stock Exchange are India's premier stock exchanges.

The aggregation of buyers and sellers (a loose network of economic transactions, not a physical facility or a separate entity) of shares (also known as shares) containing ownership claims on undertakings is a capital market, which can include stocks listed on the public stock exchange, as well as securities only exchanged privately. Examples of the above include private firms' shares that are sold by equity crowdfunding sites to customers. Stock exchanges list common equity holdings as well as other types of debt, such as corporate and convertible bonds.

PRICE DISCOVERY VS. VALUATION

Discovery of the price is not the same as valuation. Whereas price discovery is a process driven by the economy, valuation is a mechanism driven by models. Valuation is the current value of assumed cash flows, interest rates, competitive analysis, in-place and projected technical improvements and several other considerations.

Equal value and inherent value are other names for valuating an asset. Some analysts can decide whether an asset is overpriced or underpriced by the economy, by matching market value to valuation. Of course, the real right price is the market price, although any variations which provide trading opportunities if and when the market price changes to incorporate any details not previously considered in the valuation models.

The method of price discovery (also called the price discovery mechanism) is the process by which buyers and sellers collaborate to determine the price of a commodity in the marketplace. Both main roles of price discovery are fulfilled by the futures and options market. In order to take advantage of such information, people with greater experience and judgement are interested in these industries. For example, as a new information arrives, maybe some positive news about the economy, the activities of speculators easily feed their information into the derivatives market, allowing the price of derivatives to adjust. Therefore, these markets indicate what is likely to happen and thus assist in better price discovery.

DETERMINATION OF PRICES

Price determination involves the determination of the quality of the products sold and of the services provided in the free market. The powers of demand and supply decide rates in a free market.

The assessment of price and the exploration of price are interrelated. The market price level is determined by price calculation, and the general price level can be high or low. However, questions and worries regarding price discovery escalate when commodity rates are poor or are dropping. One method of analysis into market exploration seeks to establish variables that describe transaction price fluctuations.

STOCK MARKET

A stock market is an exchange where equity, bonds, and other instruments can be bought and exchanged by stockbrokers and traders. Most major firms have their shares listed on the stock market. This makes the inventory more liquid and thus more enticing to many buyers. The exchange may also serve as a settlement guarantor. Other stocks, that is, through a broker, can be sold "over the counter" (OTC). To draw foreign buyers, several major corporations will have their shares listed on more than one exchange in various countries.

SPOT MARKET

A public financial instrument or asset is exchanged for instant sale on the spot market or cash market. It requires a futures market in which supply is expected at a later date. The spot market is where financial instruments are exchanged for immediate distribution, such as commodities, currencies and shares. The exchanging of cash for a financial instrument is distribution. A futures contract, on the other hand, is focused on the arrival at a specific date of the underlying asset. Spot trading and/or futures trading can be provided by exchanges and over-the-counter markets (OTC).

Physical markets" or "currency markets" are also referred to as spot markets because trades are effectively swapped immediately for the asset." Although it can take time for the formal movement of funds between the buyer and seller, such as T+2 on the stock exchange as on other currency trades, all parties agree to the "right now" trade. A non-spot or futures exchange currently agrees to an amount, but at a later date it will take place to execute and transfer funds.

COMMODITY MARKET: AN INTRODUCTION

An external object a thing which through its qualities satisfies human needs of whatever kind.

~Karl Marx

The market for commodities is a market where raw or primary materials are sold. These raw materials are exchanged on regulated markets of commodities in which they are acquired and sold on structured contracts.

MARKET TRADING TIMING

Agriculture commodities

Monday to Friday: 10:00 AM to 5:00 PM

BULLION, ENERGY & METAL COMMODITIES

Monday to Friday: 10:00 AM to 11:30 PM

SETTLEMENTS

Like equity the commodities market also goes thru settlements usually monthly or bimonthly in commodities the frequency of settlement differs:

e.g. bullion (gold and silver) delivery happens on 5th of the expiry month.

Delivery starts from 1st so clients have to square off their position on last working day of the previous month of expiry month (ex. 5th March expiry, clients have to square off o 28th of Feb) and rollover to next month because:

- Liquidity dries up in the current month.
- Open position may result in delivery.
- If a client does not square off, risk will square off position (unless client gives specific intention to for deliveries).
- In Agri commodities delivery on 20th of the expiry month.
- Clients have to square off position or rollover to next month, five days before the contract expiry.

PRICE DISCOVERY PROCESS

Price discovery is one of the financial features of futures markets. This reveals knowledge via the derivatives market about potential spot prices. For the following cause, the price discovery between spot and future markets has attracted substantial interest from economists, investors and regulators; the topic is related to knowledge efficiency and arbitrage. Price exploration refers to the use of futures prices for pricing transactions on the cash market (Working 1948). Price discovery of futures markets is described by the use of futures prices to assess (future) cash market price projections (Schroeder & Goodwin, 1991). The key advantages of commodity futures markets are educated production, storage and processing decisions, according to Black (1976). The essence of the function of price discovery is to assess a reference price from which the spot market can be obtained, based on whether new knowledge is first expressed in

changing futures markets or in changed cash prices. The price of futures acts as the expectation of the market for subsequent spot

STATEMENT OF PROBLEM

The effect of commodity futures pricing on physical market prices is one of the controversial concerns among analysts and policy markers affiliated with commodity markets. Futures must be closely linked to physical commodity values and can also act as a hedging mechanism. Futures markets must serve as a "reference price" for the physical market participants. In other words, this guide price is known as the method of "Price Discovery." Commodity exchanges: The task of MCX and NCDEX is to add market productivity to the twin functions. It is important to examine price discovery and risk control processes by understanding the price determination process.

RESEARCH GAP

There is no doubt that the examined literature has shed some useful light on the different strategies emerging in the commodity markets of the world. In particular, national-level markets have achieved widespread admiration and appreciation. They will, however, climb to larger heights. The examined literature does not set out the policies and remedial steps needed to carry the markets to new heights on all fronts, including the regulatory front. The literature analysed for this reason suffers from a void. It is this void which this research aims to fill.

OBJECTIVE OF THE STUDY

1. Identify the factors that can lead to efficient and transparent price discovery.
2. Examine how the commodity exchanges have benefitted the various stakeholders.
3. To measure relative contribution of spot and future market in the price MCX and their respective individual future.
4. To investigate whether size and sector of the firm affect price discovery process.
5. To test the weak form market efficiency of Crude oil and Gold traded on MCX by using OLS regression and econometrics tools like co-integration, VAR, VECM, and Wald test.

6. To Prove if speculation in the future markets has a significant impact on the unexpected movement of the spot prices of Crude oil and Gold.

SIGNIFICANCE OF STUDY

New commodity futures markets have demonstrated low market depth, limited sizes, underdeveloped spot markets, regulatory limits, high taxes on commodity trading (commodity transaction tax), weak logistics mechanisms and market imperfections in many developing countries, such as India. In order to further stabilise markets and enforce other regulation measures, an effective economy benefits the government. It provides traders and suppliers of goods with accurate forecasts of potential spot prices. Therefore, the price market efficacy and unbiasedness of the respective goods in Indian commodity exchanges need to be empirically studied.

ECONOMIC RATIONALE FOR THE FUTURE MARKET

In the spot market, commodity futures markets play an important part in focusing on inventory decisions. The futures market is the hub for gathering and disseminating information on agents' preferences for potential spot prices.

Thus, the trading of commodity futures performs price discovery functions that enable spot market participants to make reasonable decisions about inventory management. This results in the uncertainty of spot markets being decreased. The expected spot prices for a future date as defined by future commodity trading on the basis of information gathered by stakeholders will result in several benefits for discretionary decision-making and allocation of resources, such as: price discovery calculated on the basis of predicted, current and future, supply and demand in this competitive market.

SCOPE OF STUDY

In terms of price creation of commodities such as crude oil and gold, this thesis is limited to the examination of the potential demand efficiency of the MCX in India. Only the poor form of market productivity is being investigated. This research does not take into account problems relevant to organisational performance, such as warehousing, employer-employee partnership, the management aspect. There is also an

attempt to assess the effect of speculation on the spot prices of the corresponding commodities. On the basis of mathematical tools, the influence of speculation is judged. The analysis does not provide any qualitative details related to the regular spot prices and futures contract prices for the sample commodities over various periods. Data were obtained from the official MCX website. For the analysis, the data duration ranges across commodities. The research period, however, includes the available data from the year 2009 to 2019.

RESEARCH METHODOLOGY

This was causative research on the relationship between spot commodities and prices for futures. This was an empirical study of the spot prices and futures of different commodities. Therefore, its approach draws heavily from quantitative methods, being a study on the weak form of efficiency in the commodity market.

Causal research as an investigation of a problem that examines the effect of one thing or another.

To explain the patterns of relationships between variables, causal studies concentrate on an analysis of a situation or a specific problem. In studies with causal research design, experiments are the most common primary data collection techniques.

DATA SET

The near-month futures contracts are the most liquid to measure potential price collection. Near month contract to prevent termination and expiration or rolled impact two days before expiry. In nature, data used in analysis was secondary. The research spans the 10-year period from 2009 to 2019. Data collected by the researcher in this time frame with the holidays and expiry of the deal in mind. Full observation 2486 of the closing price of the contracts was taken into account. For this reason, data obtained from Bloomberg & MCX (Multi Commodity Exchange) However, due to their late arrival on trading markets, the data duration differs from commodities. The data was analysed with the aid of multiple data Tools for statistical and econometrics. The R (R studio) and MS Excel applications used in this analysis.

PRICE DISCOVERY FROM PANEL DATA MODEL

Narayan, Sharma and Thuraisamy (2014)

Panel data analysis is a statistical approach that is commonly used to analyse two-dimensional (typically cross-sectional and longitudinal) panel data in social science, epidemiology and econometrics. The data is typically obtained over time and over the same people, and over these two dimensions a regression is then carried out.

TIME- VARYING PRICE DISCOVERY

Avino, Lazar,andVarroto (2015)

A time-varying covariate (also called time-dependent covariate) is a concept used in statistics, especially in survival analyses. This illustrates the fact that over the whole analysis, a covariate is not always constant.

FINDINGS

We report descriptive statistics of daily futures and options trading activity in Table 0. Futures and open interest figures (expressed in thousands) were always higher than the corresponding choice forecasts. The amount of daily crude oil for futures (options), for example, is 892.65. The value of regular futures is comparatively much higher than the volume of options in the 640.89 gold market. Futures open interest on the crude oil and gold markets is higher (smaller) than options open interest(OI).

In comparison, quoted spreads are much smaller for standard futures than quoted spreads for options. For both commodities, typical futures (options) quoted premiums range between 0.005 and 0.6488 (0.218 and 11.491). Mean option spreads, for example, are about twenty times larger than futures spreads in the markets for gold and crude oil.

The mixture of reduced market activity and larger quoted option spreads means that options are slightly less liquid than futures. Option prices are also expected to be noisier than futures prices, affecting the ability of traditional price discovery measures to predict price discovery correctly (Yan and Zivot, 2010; Putniš, 2013).

A required criterion for data from a time series is that the data must be stationary. For the selected sequence, the stationary tests produced by Augmented Dickey Fuller were conducted, and the results were displayed in the table. For the series, Phillips and Perron (1988) stationary experiments were also carried out to double check the robustness of the findings. The results of this test are listed in the table . Using the Akaike Knowledge Criterion, the optimal lag numbers of each sequence were evaluated by the (AIC). It was observed from the calculations of the Augmented Dickey Fuller (ADF) and Phillips Peron (PP) test results that the sequence at their stages were stationary.

CONCLUSION

The motivation for this thesis report arises from developments in the ability to trade commodity derivatives and resulting increases in trading activity, a lack of understanding regarding the role of futures options in price discovery, and due to a continued debate regarding the role of hedgers and speculators in the price formation of commodity derivatives. As a result, we provide a unique examination of price discovery in two different commodity futures options markets and we analyze the role of speculators and hedgers in the price discovery process. Using intraday data, we estimate conventional and new empirical measures of price discovery, noting that they measure different components of price discovery. In our setting, IS and CS partly measure the relative level of noise between the two markets, and ILS captures the relative speed with which each market reflects new information (this is the traditional focus of using empirical measures of price discovery).

Furthermore, using open interest and volume data, we use two measures—R to identify speculation and hedging activity in commodity derivatives markets Despite lower levels of liquidity, on average we find that options lead futures in reflecting new information in the crude oil, gold, silver, corn and soybean markets. For example, such findings are consistent with recent developments in trading platforms allowing various market participants the flexibility and ease to trade a variety of options strategies. Although a majority of price discovery occurs in options (approximately 0.55–0.60), a large fraction of price discovery occurs in futures markets (approximately 0.40–0.45), indicating that informed trading occurs in both venues.

In addition, we find that speculation is a significant determinant of price discovery in commodity derivatives. More specifically, we report that increased speculation in commodity derivatives is associated with increases in the options market's contribution to price discovery and such a result is consistent with the theory of backwardation. In examining price discovery between markets of differing levels of liquidity, our findings highlight the importance of accounting for the noise differential using empirical measures such as ILS.

We conclude that Indian commodities market is still not perfectly competitive for some commodities. Overall, the price discovery results are encouraging given the nascent character of Indian commodity market. The commodity market in India needs strong policy support owing to its relevance in the macro economy with implications for price inflation, economic growth and employment. Hence there is an urgent need that the policy makers to support these trading platforms with infrastructure development, fiscal incentives, encouraging product innovation, widening investor base and investor education so that they are able to realise their true potential. Consequently, the institution of manager (or investor) should understand the futures markets clearly and supervise (or invest) properly to ensure the efficiency of futures market. More importantly, the international pricing authority in Indian futures market should be improved as quickly as possible in order to maintain economic security. The present research contributes to alternative investment literature for emerging markets.

Future research can examine the level of price discovery in other commodity and other derivative markets. Furthermore, with the increasing popularity of futures options, increases in electronic trading, changing regulation and market structure, further research can examine the drivers of trading activity and price discovery, especially as other countries/ exchanges introduce commodity derivatives trading Platforms.

SUGGESTION FOR FUTURE RESEARCH

In order to differentiate the relationship condition of two markets, we will use the future market and spot market characteristics to form a ratio and we also discuss whether the spot market situation will affect the lead-lag impact relationship.

Their final step would allow the continuous selling of the spot market, which is the same as the future market. If the spot market is still engaged in continuous trade, this situation would be closer to other countries. The lead-lag effect would be smaller than before and even decrease to a few seconds with the advent in technology and wider use of algorithm trading and high frequency trading. That is to add, we need quicker pace for evaluating the market situations in order to exploit the lead-lag effect.

We suggest that the improvement in the spot market's matching mechanism would have a substantial impact on the strength of the lead-lag effect. The speed of trade is potentially the main point for deciding the efficiency of the trading strategy.

In addition, studies will explore this topic from many perspectives, such as market liquidity, counterparty risk, discovery of credit risk, etc. Both price discovery measures are often focused on a linear co-integration process and the rolling window approach is used to gain contributions to the time variable price discovery, so it is also important to analyse the process of credit risk discovery in a non-linear co-integration system

The final recommendation for future study is therefore to investigate the directional and complex causality relationship between the returns of sovereign CDS and the commodity index in both mature and developing economies using a non-linear markov switching system.