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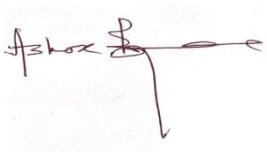
Editorial

This is the month for two big budgets-Railways and Finance. We'll carry some analyses of budget and economic survey that have implications for equity, credit, and bond markets. In fact, on the day of the release of this issue, Union Budget has already been presented. We are not carrying any snap shots on the budget in this issue. Wait for the next number!

This issue covers three articles. The first piece deals with Algorithmic Trading, its uses and possible abuses. The second article raises some questions on the new bank licensing policy and evaluates whether it would be good for the country as a whole or are we going back to pre-1969 regime. The third article looks at the relationship between gold and crude oil prices. The article finds that The study finds that even though the general price level of gold and oil evolve in a similar direction, the relationship may not be tradable based on data for the long term.

I hope you'll enjoy reading the newsletter. Please offer suggestions for further improvement to ashok@iimcal.ac.in



Editor

TABLE OF CONTENTS

Algorithmic Trading

Prof. Ashok Banerjee

Ashok Banerjee, Ph.D., is Professor, Finance and Control, Indian Institute of Management Calcutta (IIM-C). He is also the faculty in-charge of the Financial Research and Trading Lab at IIM-C. His primary research interests are in areas of Financial Time Series, News Analytics and Mergers & Acquisitions.

Introduction

Trading strategy is defined as a set of rules for making trading decisions. Such rules may be applied by people to execute trade by placing orders 'manually'. However, whenever trading rules are applied by a computer 'automatically' to execute trade, it is called programme trading or algorithmic trading. An automated trading strategy 'wraps wraps trading formulas into automated order and execution systems'. The computer algorithm also decides on certain finer aspects of the order such as the timing, price, or even the final quantity of the order. Algorithmic (popularly called, algo) trading is widely used whenever a hedge fund, pension fund, or other institutional trader wanted to place a large order with minimum market impact costs. The computer programme in that case will slice the large order into smaller lots and will execute small size trades in appropriate time without causing any noticeable change in the price. In other words, algo trading helps in minimizing trading costs. Algo trading can be used for market timing, arbitrage or pure speculative transactions. Algo trading is also useful whenever a large institutional investor intends to execute trade on the basis of 'information'.

The success of algo trading depends on the robustness of the algorithm and speed of execution. Algo traders try to exploit a small bid-ask spread by executing large orders in short span of time. Indian stock exchanges offer co-location facility to trading firms to allow faster trading. Co-location is when brokers locate their computer servers physically within metres of an exchange's system to shave off milliseconds off the time it takes to execute a trade.

Algo trading is alleged to be main force behind occasional market crash. How does that work? With the popularity of algo trades, many traders, unconnected with each other, place orders for directional trade.

Assume there is a set of algos across unconnected desks which are programmed for directional trade, whether up or down. As long as one is making profits, the programme rides the trade. Once an abnormal trade (generally in frontline index stocks) is entered into the system by any broker and a specific stock or a set of stocks start moving down sharply, a number of other algos come into play based on their programmed logic, and thus go short on the specific stocks or the index, as the direction is down. This happens in a matter of seconds or milliseconds and hence market could crash before any one gets to know about it. (http://blogs.reuters.com/india-expertzone/2012/10/05/).

Regulatory Response

The regulators were highly watchful of the roles that algo traders have on market dynamics. In case of any flash crash, algo traders become the fall guy. Algo traders, on the other hand argue, that they provide liquidity in the market and thereby facilitate better price discovery. It is alleged that algorithmic or programme trading was instrumental for "flash crashes". During Mahurat Trading in October 2011, such a program trading created a ruckus in the BSE, so much that the exchange canceled all trades made on that day to avoid a payment crisis. If the transaction cost of trade is high, it discourages programme

trades. Thus, any lowering of the Securities Transaction Tax (which has been a favourite demand of high frequency traders) would encourage algo traders.

The stock exchanges in India witness significant algo trades. According to an estimate, about one-third of the trade in both cash and derivatives segments of the National Stock Exchange (NSE) are programme trading. The Securities and Exchange Board of India (SEBI) has allowed trading through algorithm. The SEBI has recently asked all algo traders to undertake Algorithmic System's audit every six months through Exchange empanelled system auditors & submit the report to the Exchange. This audit requirement will be effective from March 2013.

The Forward Market Commission (FMC), the commodity market regulator in India, had banned algorithmic trading in micro and mini contracts effective December 1, 2012. These small size contracts were originally launched to benefit small traders. FMC observed, in utter dismay, that only large traders have availed the benefit of algo trading in such contracts and small and marginal traders were largely unaware of such small trading lot and tick size contracts. Recently, in February 2013, the Chairman of FMC informed that of the daily trading volume (about ₹80,000 crores) in the commodity futures markets, around a fifth of volumes on metals and energy bourse MCX and and close to a tenth of volumes on agri bourse NCDEX are generated by algos. Commodity exchanges have been asked to penalise brokers who place huge orders not resulting into trades and brokers will not be allowed to place more than 20 orders per second.

Data Analysis

We looked at intraday trade data of ten NSE-listed companies over a fifteen day period- January 1-15, 2013. Table 1 shows that Infosys counter witnessed highest fluctuation in daily traded volume during this period. Reliance Industries, on the other hand, had seen more steady trading volume during the same period. Trading volume was generally low in the first week of January 2013- perhaps due to calendar year effect.

Table 1 Daily Traded Volume

Company	Highest Volume	Lowest Volume	Date-highest	Date-lowest
SBI	462665	227585	20130114	20130107
Infosys	1621988	33193	20130111	20130101
Reliance	603859	205885	20130103	20130114
L&T	312305	105340	20130115	20130101
ITC	980396	144604	20130111	20130101
Wipro	528148	52272	20130111	20130109
ICICI Bank	743030	104903	20130109	20130108
Axis Bank	390806	63478	20130115	20130107
Ultratech Cement	85050	1229	20130110	20130108
TCS	591953	30049	20130115	20130101

Data Source: The Financial Research and Trading Laboratory, IIM Calcutta

Next we look at single trade size in a day. Table 2 reports size of the single largest trade on the total traded volume of the same day. In most of the cases, the largest trade size is less than 5% of the total trades of the day. This indicates a clear case of trade slicing- a phenomenon widely used in algo trading. During days of lowest trading volume (Table 3) , the highest single trade size is under one percent. In other words, trade sizes are split more during low volume days implying thereby that one witnesses more programme trading during low volume period.

Table 2

Company	Trade	% Trade
SBI	5000	1.2%
Infosys	7971	0.5%
Reliance	8124	2.4%
L&T	4000	3.0%
ITC	10000	2.7%
Wipro	5000	6.3%
ICICI Bank	5678	0.8%
Axis Bank	19864	19.4%
Ultratech Cement	4962	18.4%
TCS	2383	0.4%

Data Source: The Financial Research and Trading Laboratory, IIM Calcutta

Table 3

Company	Trade	% Trade
SBI	836	0.3%
Infosys	348	0.7%
Reliance	1500	0.6%
L&T	509	0.4%
ITC	2880	1.0%
Wipro	583	1.0%
ICICI Bank	1000	0.6%
Axis Bank	500	0.6%
Ultratech	46	3.7%
TCS	400	1.3%

Data Source: The Financial Research and Trading Laboratory, IIM Calcutta

We, therefore, observe that trades are regularly split to minimize trading costs and the slicing is automated. Large traders invest significant sum of money in getting high speed machines, servers, programming wizards in order to get a 'millisecond' advantage. Whether algo trading is good for the market is a question yet to be answered.

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New Bank Licensing Policy in India: Quo Vadis?[1]

Prof. Partha Ray

Partha Ray, Ph.D., is Professor, Economics, Indian Institute of Management Calcutta (IIM-C). Prior to joining IIM-C, Prof. Ray, a career central banker, was the adviser to Executive Director, International Monetary Fund, Washington D.C. during 2007-2011.

Ever since the bank nationalization in July 1969, India has been traditionally dominated by public sector banks. It is instructive to turn to Dr I G Patel, the then Secretary, Economic Affairs (and later Governor of the RBI) to get the context. In his autobiography Dr Patel mentioned the following,

> "It was, I think, later in July 1969 that I was sent for once again. No one else was present. Without any fanfare, she (the Late Mrs. Indira Gandhi, the then Prime Minister and Finance Minister as well) asked me whether banking was under my charge. On my telling that it was, she simply said: 'For political reasons, it has been decided to nationalise the banks....' There was no pretence that this was a political decision".[1]

Dr. Patel is said to have offered two suggestions to Mrs Gandhi: (a) foreign banks should not be nationalized; and (b) instead of nationalizing all banks, it would be better if only the major banks, which accounted for 85–90 per cent of the total banking business, were nationalized; both these suggestions were accepted.

While the banking network under the public sector auspices has been growing tremendously during the 1970s and 1980s, which had made great strides in terms of financial inclusion and spurt in financial savings, there were serious issues relating to their efficiency as well as product range. After the initiation of financial sector liberalization since the 1990s, thus, the banking sector in India has been made open to the private players. Accordingly, extremely successful private sector banks like ICICI Bank or HDFC Bank emerged in the 1990s. For quite some time there were demands for reviewing the existing bank licensing policy. Perhaps in the aftermath of the global financial crisis, there was some lull in such demands. But, in his Budget Proposal for 2010-11 (of February 26, 2010) the then Finance Minister Mr. Pranab Mukherjee announced that,

"We need to ensure that the banking system grows in size and sophistication to meet the needs of a modern economy. Besides, there is a need to extend the geographic coverage of banks and improve access to banking services. In this context, ...the RBI is considering giving some additional banking licenses to private sector banks. Non Banking Financial Companies could also be considered, if they meet the RBI's eligibility criteria" (para 38).[2]

Accordingly, the RBI had put out a Discussion Paper on August 11, 2010 inviting feedback and comments. Apart from receiving the comments the RBI had extensive discussion with important stakeholders. The gist of these comments and discussions was placed on the RBI's website on December 23, 2010. Subsequently, the draft guidelines on 'Licensing of New Banks in the Private Sector' were released on August 29, 2011 for comments. Subsequently, the guidelines have been finalized taking into

[1] See, Patel I. G. (2002): *Glimpses of Indian Economic Policy: An Insider's View*, Delhi: Oxford University Press; (p. 135).
[2] Available at http://indiabudget.nic.in/ub2010-11/bs/speecha.htm

account the important amendments in December 2012 to the Banking Regulation Act, 1949. More recently, on February 22, 2013, the Reserve Bank of India (RBI) has released guidelines for licensing of new private sector banks.

The Key features of the new policy are as follows:[3]

- **Eligible Promoters:** Entities / groups in the private sector, entities in public sector and Non-Banking Financial Companies (NBFCs) shall be eligible to set up a bank through a wholly-owned Non-Operative Financial Holding Company (NOFHC).
- **'Fit and Proper' criteria:** Entities / groups should have a past record of sound credentials and integrity, be financially sound with a successful track record of 10 years.
- **Corporate structure of the NOFHC:** The NOFHC shall be wholly owned by the Promoter / Promoter Group. The NOFHC shall hold the bank as well as all the other financial services entities of the group.
- **Minimum voting equity capital requirements for banks and shareholding by NOFHC:** The initial minimum paid-up voting equity capital for a bank shall be ₹ 5 billion; within which the NOFHC shall initially hold a minimum of 40 per cent of the paid-up voting equity capital of the bank. This shall be locked in for a period of five years and which shall be brought down to 15 per cent within 12 years. The bank shall get its shares listed on the stock exchanges within three years of the commencement of business by the bank.
- **Regulatory framework:** While the bank will be governed by the provisions of the relevant Acts, the NOFHC shall be registered as a non-banking finance company (NBFC) with the RBI and will be governed by a separate set of directions issued by RBI.
- **Foreign shareholding in the bank:** The aggregate non-resident shareholding in the new bank shall not exceed 49 percent for the first 5 years after which it will be as per the extant policy.
- **Corporate governance of NOFHC:** At least 50% of the Directors of the NOFHC should be independent directors.
- **Prudential norms for the NOFHC:** The prudential norms will be applied to NOFHC both on stand-alone as well as on a consolidated basis and the norms would be on similar lines as that of the bank.
- **Exposure norms:** The NOFHC and the bank shall not have any exposure to the Promoter Group. The bank shall not invest in the equity / debt capital instruments of any financial entities held by the NOFHC.
- **Other conditions for the bank:** Besides, there are other conditions like, (a) the Board of the bank should have a majority of independent Directors; (b) the bank shall open at least 25 per cent of its branches in unbanked rural centres (population upto 9,999 as per the latest census); (c) the bank shall comply with the priority sector lending targets and sub-targets as applicable to the existing domestic banks; (d) banks promoted by groups having 40 per cent or more assets/income from non-financial business will require RBI's prior approval for raising paid-up voting equity capital beyond `10 billion for every block of ₹ 5 billion.

[3] Available at http://rbi.org.in/scripts/BS_PressReleaseDisplay.aspx?prid=28191

Besides, existing NBFCs, if considered eligible have been permitted to promote a new bank or convert themselves into banks.

Going forward, applications for floating banks need to be submitted to the RBI by July 1, 2013. While in the first stage, the applications will be screened by the RBI, subsequently, the applications will be referred to a High Level Advisory Committee (the constitution of which is to be announced shortly). Once the Committee submits its recommendations to the RBI, it will take a decision to issue an in-principle approval for setting up of a bank.

Who are going to come to the fray? There were unconfirmed press reports that not more than four to five licenses may not be issued by the RBI (*Financial Express*, February 25, 2013) or that some of the leading investment banks may develop cold feet. There are still some concerns. Is floating of banks by corporate houses a good thing? Will it compromise on the age-old principles of conservative banking that seemed to have serviced India well? Will the Budget for 2013-14 make any fresh announcements? While many of these have been examined in detail at the discussion stage, going forward, stakeholders may need clarity on many such issues. Watch this space in the days to come!

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Gold Oil Ratio and its Implications*

Dr. Golaka C. Nath

Dr. Golaka C Nath is a Senior Vice President at the Clearing Corporation of India Ltd. (CCIL). He has over 21 years of experience in the banking and financial sector, having previously worked with the National Stock Exchange of India Ltd. and Vijaya Bank. In the past, he has worked on a World Bank Project on "Developing Bond Market in South Asia". He has also provided secretarial service to the High Powered Committee on "Corporate Bonds and Securitization" appointed by the Ministry of Finance, Government of India.

Gold is one of the most traded precious metals while oil is the most traded raw material. They play an important role in any economy. Typically, Gold and Crude Oil prices tend to move together and have good correlation. There are two important reasons for this – (a) historically, gold was used by countries to buy oil and a large part of the proceeds from oil revenue ends up in investment in gold. As oil prices move upward, the oil economies receiving such surplus funds invest much of this surplus in gold or other hard assets; (b) rising oil prices place upward pressure on inflation and this enhances the appeal of gold because it acts as a hedge against inflation. By using gold as a currency, we can value the price of crude oil using the oil gold ratio. This ratio is independent of any currency and any other measure of inflation.

Crude Oil is an important commodity that affects economy of every country. The higher price of crude will benefit the oil producing and exporting economies and affects negatively the countries which import oil for their domestic consumption. Oil production and consumption is used as an indicator of economic activity. Changes in its price quickly affects the consumer prices (inflation) leading to shifts in monetary policy which will have a significant impact on the economy. In contrast to this, gold is a commodity that does not produce any regular income by holding and the holders' revenue depends on the price appreciation because of enhanced demand for the commodity as against lower supply. Gold is used by central banks as a reserve component and all central banks hold huge amount of gold in their vaults. Gold is basic part of the international reserve portfolio of most countries, including the oil producing countries. Demand for gold increases when investors would like to put their money in safe assets. Having a clear understanding of the gold/oil ratio is one of the keys ways to visualize why rising oil prices is not bad for all economies. Higher crude oil prices result in slowing down the economy as a whole and resultant inflation reduces disposable income for people. This does eventually adversely affect investment climate and specifically financial markets in particular; gold typically shines very well during these very times. The gold/oil ratio is simply computed by dividing the international gold price by the crude oil price (in the same currency).

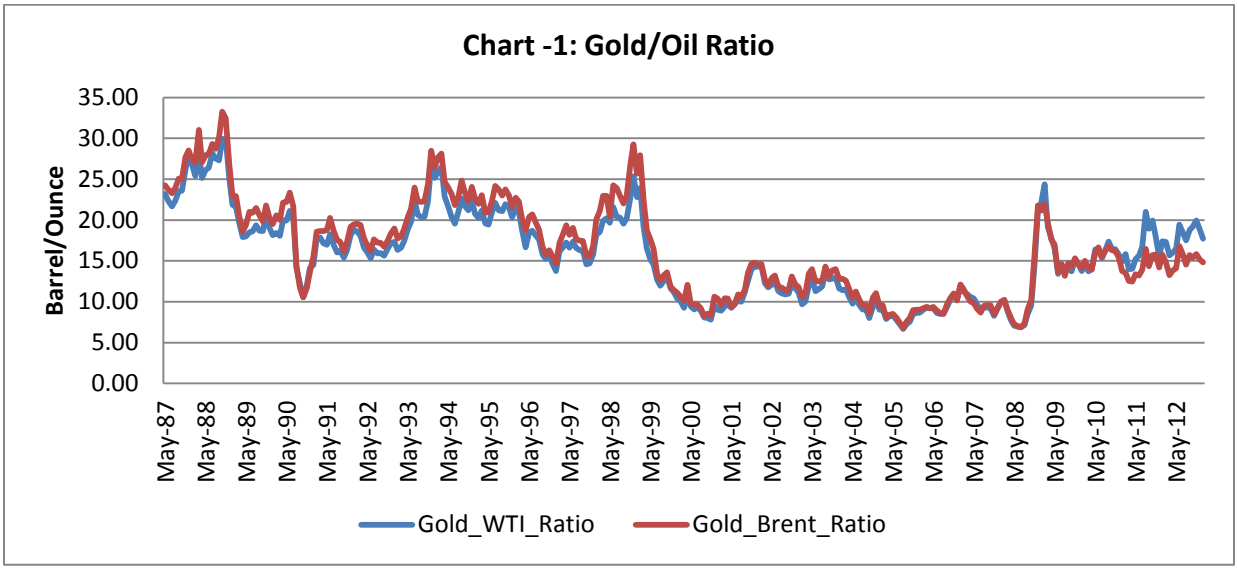
Historical Gold Oil Relationship

Typically Gold and Crude Oil price movements have great correlations. They deviate tactically over shorter periods of time as their respective supply-and-demand influences dictate, but over the long run they move together. Historically, an ounce of gold can buy about 16 barrels of oil. For a period of 309 months (from May'87 to Jan'13), gold could buy about 15.72 barrels of WTI crude and 16.44 barrels of Brent. Both Brent and WTI crude prices also move very closely with each other but in recent times, they

** Personal views of the author only and not the views of his organization*

have widened to some extent (Chart -1). Gold Oil price ratio is a measure that is not biased by inflation factor.

One ounce of gold currently can buy about 15 barrels of oil which is very close to the long term median and it means that gold is fairly valued in relation to oil. The historical low was set in 2008 (financial crisis) at close to six barrels for one ounce.



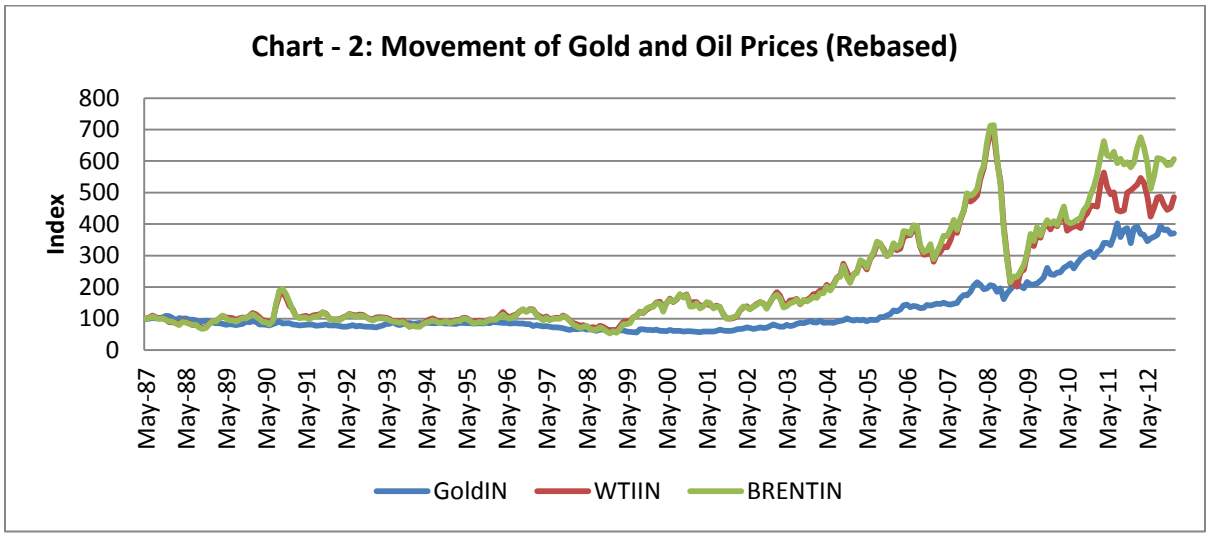
The descriptive statistics for oil gold price ratio shows that the median ratio is 15.72 against the long term average of 16.43. The current ratio of about 14.84 barrels per ounce is very close to the long term average as well as the median.

Table –1: Gold Oil ratio (Brent) (May 1987 – Jan 2013)	
Mean	16.44
Standard Error	0.33
Median	15.72
Standard Deviation	5.86
Sample Variance	34.33
Kurtosis	-0.59
Skewness	0.44
Range	26.47
Minimum	6.77
Maximum	33.24
Count	309

Changes in the gold prices theoretically have no plausible economic linkage as far as the price of oil is concerned. The oil price does not drive the gold price and the only reason the two markets have similar long-term trends is that they have one important long-term driver in common: monetary inflation. Many factors like political issues, the supply and demand, the status of alternative energy sources and the financial markets influence the price of oil. However, while oil price changes have a significant impact on world financial markets, they do not have a direct effect on fluctuations in the world gold market. Gold and oil prices have many common factors that influence the prices of these goods to move in the same

direction. Gold is considered to be a hedge against inflation. Rising global oil prices is likely to fuel inflation, in which case investors will be most willing to direct their investments in assets that will have the highest resistance to inflation. Gold, being a stable reserve for many central banks, will be the most preferred asset class. The demand for gold is likely to increase and this will lead to higher gold prices. However, the reverse is not true - increases or decreases in gold prices may not have an effect on oil prices.

Due to increasing international concern over rising sovereign debt after the financial crisis and the continued decline of the major currencies like US Dollar, Euro, global demand for gold has increased significantly. India and China are major gold markets and their domestic demand has in recent years had a significant impact on global gold price developments. Some of the central banks have been net buyers of the yellow metal in recent times further increasing the demand for gold.



The movement of gold prices has been steadily upward while crude oil prices have moved through ups and downs, specifically aftermath of the financial crisis, recession fears pulled down the oil prices significantly but later it started moving upward. By indexing the prices of gold, Brent and WTI crude (with a base of 100), we find that oil prices have outperformed gold but the volatility is also very high for crude oil.

Table – 2: Performance of Gold and Crude (1987-2013)

	WTI	BRENT	GOLD
Mean	8.7%	10.0%	5.8%
Median	8.4%	9.4%	3.3%
STD	22.4%	24.1%	12.9%
Return/Std dev	0.39	0.41	0.45

The study finds that even though the general price level of gold and oil evolve in a similar direction, the relationship may not be tradable based on data for the long term. It is possible for short-term patterns to emerge occasionally. So, even though there seems to be no proved relationship between gold and oil monthly returns over the long term, it may happen that a relationship can unveil itself in a short period of time that may offer trading opportunities to investors. The study finds that there seems to be a relatively strong relationship between gold and oil prices but not between gold and oil monthly returns. The strength of the relationship between gold and oil coincides with high or low gold returns. This relationship may not be useful for speculation over the long term but it's possible that patterns emerge locally, in short time spans.

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