

## Role of Commodity Market in Hedging Price Risk with special reference to Crude Oil Future

HARPREET KAUR ARORA\*  
SIMRANJEET KAUR SANDHAR\*\*

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### Abstract

In ever increasing uncertainties of commodity market, providing risk management is necessary for future exchanges. In recent years commodity exchanges have had to be effective in hedging, especially in commodity like crude oil whose prices are prone to highly variance. An attempt therefore has been made to critically study and evaluate role of commodity market in mitigating price risk by taking data on future prices of crude oil on Multi Commodity Exchange of India (MCX). The Study examines past data on future prices and spot prices of crude oil by Ederington's measure of hedging efficiency and verifies the result on the basis of hedge ratio, minimum variance ratio and regression analysis. The Study suggests that MCX had been successful in providing for hedging and is also expected to provide for certain risk management tools such as mechanism to identify, measure, manage and monitor risk to reduce speculators while provisioning for greater efficiency and competition.

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### I. Introduction

THE VARIABILITY IN returns, uncertainties in gains and chances of losses has been an important concern in any type of business and investment. Gone are the days when war, weather conditions and natural calamities were to a larger extent responsible for prospects of nations, business and individual until the introduction of financial instruments like forwards, futures, options, swaps and many other derivative contracts. Commodity producers and consumers, whether they want direct consumption or as a raw material for their manufacturing process get the benefits of commodity market and reduce risk of losing their money with changing prices of commodity. We can say that it is the one of a major economic function as it provides certainty to earn from and pay for commodities.

\* Associate Profesor, Indore Institute of Science and Technology Sahil Group of Instiutions, Pithampur Road, Rau, Indore, Madhya Pradesh 453331, INDIA

\*\* Faculty, Sanghvi Institute of Managment and Science, Behind Indian Institute of Management, Pithampur Road, Rau, Indore, Madhya Pradesh 453331, INDIA

## VI. Limitations

Finding of this research cannot be generalized for all commodities on Multi Commodity Exchange as each commodity get affected by various factors that may be peculiar. For further understanding of hedging, more suitable models can be implemented that take into account the variability of data over time.

## References

- Andre Assis de Salles, (2013), "An Investigation of Some Hedging Strategies for Crude Oil Market", *International Journal of Energy Economics and Policy* Vol. 3, No. 1, pp.51-59
- Bailey, W. and K. C. Chang, (1993), "Macroeconomic Influences and the Variability of the Commodity Futures Basis," *Journal of Finance*, Vol. 48, pp 555-573.
- Ederington, Louis, (1979), "The Hedging Performance of the New Futures Markets", *The Journal of Finance*, Vol. 34, No. 1, 157-170.
- Gronvik, G., (2008), "On Commodity derivative and the Norwegian initiative to create fish derivative market." *Economic Bulletin*, pp. 30-37
- Grossman, S.J., (1986), " An Analysis of the role of insider trading on future market" , *Journal of Business*, Vol. 59 , pp. 129-146
- Howard, Charles T. and Louis J. D'Antonio, (1984), "A Risk-Return Measure of Hedging Effectiveness," *Journal of Financial and Quantitative Analysis*, Vol. 19 No. 1, pp. 101-112, March 1984.
- Hsin, C.-W., Kuo J., and C. W. Lee (1994), "A New Measure to Compare the Hedging Effectiveness of Foreign Currency Futures Versus Options," *The Journal of Futures Markets*, Vol. 14, pp. 685-707.
- Hull, John C., (2010), "Option Futures and Other Derivatives" , *Pearson Education*
- Johnson, L., (1960), "The theory of hedging and speculation in commodity futures", *Review of Economic Studies*, Vol. 27, pp. 139-151.
- Naik, G. and S. K Jain, (2002), "Indian Agricultural Commodity Futures Markets: A performance Survey", *Economic and Political Weekly*, Vo. 31 pp. 61-73.
- Penning Joost M.E. and Methew T. G. Meulenber, (1997), "Hedging Efficiency: A Future Exchange Management Approach", *Journal of Future Market*, Vol. 17, No. 5, pp. 599-615

**Annexure I**  
**Historical Data on Spot Prices and Future Prices**  
**of Crude oil Price on MCX of India**

Year	Month	Spot Price (₹)	Future Price (₹)	Changes in Spot Prices(s)	Changes in Futures(f)
2005	March	2363.7678	2360.450111	12.673286160	10.714224050
2005	April	2303.5704	2347.403278	-2.546671462	-0.552726497
2005	May	2173.5846	2204.545668	-5.642796938	-6.085771944
2005	June	2451.7885	2457.258348	12.799313170	11.463254490
2005	July	2560.6000	2560.082880	4.438045941	4.184522624
2005	August	2859.5600	2689.074962	11.675388580	5.038590083
2005	Sept	2882.0246	2879.788701	0.785596385	7.092168935
2005	Oct	2807.3034	2779.881515	-2.592663505	-3.469254050
2005	Nov	2675.1384	2685.338292	-4.707898690	-3.400980329
2005	Dec	2670.4795	2734.466409	-0.174155475	1.829494549
2006	Jan	2878.9404	2896.633850	7.806122459	5.930496731
2006	Feb	2724.6623	2806.100035	-5.358850082	-3.125483576
2006	March	2788.4512	2806.099772	2.341167197	-9.38817E-06
2006	April	3115.0784	3150.628077	11.713570600	12.277835190
2006	May	3274.2248	3248.768304	5.108905124	3.114941667
2006	June	3254.4765	3271.272891	-0.603144292	0.692711375
2006	July	3459.3209	3510.508310	6.294235033	7.313221087
2006	August	3391.2472	3433.456971	-1.967834207	-2.194876999
2006	Sept	2931.6100	2972.388497	-13.553633010	-13.428695270
2006	Oct	2644.1610	2748.364516	-9.805158258	-7.536833788
2006	Nov	2634.3772	2699.454076	-0.370015290	-1.779619832
2006	Dec	2733.0556	2796.555747	3.745796160	3.597085490
2007	Jan	2402.2557	2446.680252	-12.103665220	-12.510943000
2007	Feb	2613.0624	2623.842954	8.775364754	7.240942158
2007	March	2604.9640	2725.335277	-0.309919886	3.868079209
2007	April	2625.7392	2753.499327	0.797523497	1.033415959
2007	May	2561.2456	2620.103728	-2.456207380	-4.844584400
2007	June	2738.7442	2752.876117	6.930167103	5.067447806
2007	July	2978.1416	2986.999908	8.741137635	8.504697674
2007	August	2939.9868	2954.382628	-1.281161379	-1.091974584
2007	Sept	3176.8200	3164.002415	8.055587188	7.095214555
2007	Oct	3368.5080	3364.734630	6.033958487	6.344249741
2007	Nov	3745.3104	3712.438525	11.186032510	10.333768750
2007	Dec	3613.5029	3587.913141	-3.519267722	-3.354274638
2008	Jan	3654.6507	3670.392210	1.138723315	2.298803369
2008	Feb	3811.7844	3758.206206	4.299554537	2.392496273
2008	March	4220.1090	4214.471061	10.712164100	12.140495470
2008	April	4553.8610	4475.501062	7.908610891	6.193659825
2008	May	5285.6100	5287.139500	16.068760110	18.135141220
2008	June	5747.4684	5735.471993	8.738034021	8.479679669
2008	July	5664.2239	5764.242617	-1.448368120	0.501626095
2008	August	5045.9775	5050.462686	-10.914935760	-12.382891880
2008	Sept	4835.9095	4710.264029	-4.163078412	-6.735989912
2008	Oct	3784.5340	3840.763614	-21.741008590	-18.459695890
2008	Nov	2839.7105	2855.624402	-24.965385430	-25.649566370
2008	Dec	1997.6096	2172.369297	-29.654463020	-23.926644710
2009	Jan	2036.6993	2103.277436	1.956823796	-3.180484131
2009	Feb	1988.8992	1994.476259	-2.346939482	-5.172935109
2009	March	2438.7078	2461.992891	22.615957610	23.440571430
2009	April	2467.6050	2530.573971	1.184939007	2.785592095
2009	May	2780.9033	2865.685321	12.696452630	13.242503650
2009	June	3324.6136	3345.579154	19.551571610	16.746215260

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## Annexure I (Continued)

2009	July	3073.4265	3126.276649	-7.555377262	-6.554993742
2009	August	3469.3715	3450.387953	12.882852410	10.367326370
2009	Sept	3337.9269	3372.111212	-3.788715045	-2.268635938
2009	Oct	3551.2680	3539.156427	6.391425169	4.953727951
2009	Nov	3621.8556	3639.270717	1.987673135	2.828761378
2009	Dec	3455.4080	3478.725218	-4.595644288	-4.411474504
2010	Jan	3609.4464	3621.489966	4.457893250	4.103938646
2010	Feb	3517.7595	3521.676245	-2.540192867	-2.756150693
2010	March	3649.9400	3700.363877	3.757519523	5.073936920
2010	April	3725.6180	3761.824723	2.073403946	1.660940623
2010	May	3414.8994	3436.085110	-8.340055261	-8.659085335
2010	June	3496.5294	3517.223467	2.390407167	2.361360501
2010	July	3537.4320	3583.322242	1.169805694	1.879288456
2010	August	3601.7320	3587.718842	1.817702786	0.122696207
2010	Sept	3352.6944	3484.801646	-6.914384524	-2.868597040
2010	Oct	3639.1916	3662.829596	8.545282266	5.108696811
2010	Nov	3861.1775	3809.111186	6.099868443	3.993677194
2010	Dec	3993.9200	4026.625705	3.437876140	5.710374633
2011	Jan	4094.6864	4097.276263	2.522994952	1.754584687
2011	Feb	4002.0444	4165.786358	-2.262493167	1.672088724
2011	March	4581.3844	4630.348505	14.476101260	11.151847620
2011	April	4845.6072	4877.775387	5.767313478	5.343590918
2011	May	4544.5360	4551.135012	-6.213281176	-6.696502997
2011	June	4292.2334	4310.945740	-5.551779104	-5.277568584
2011	July	4300.6600	4327.038689	0.196322036	0.373304369
2011	August	3953.0507	3911.239125	-8.082696609	-9.609333166
2011	Sept	4194.7560	4092.436754	6.114399190	4.632742274
2011	Oct	4201.1944	4233.876577	0.153486877	3.456127286
2011	Nov	5063.9792	4931.344976	20.536655000	16.473517520
2011	Dec	5224.6656	5189.879746	3.173125198	5.242682693
2012	Jan	4967.3758	5184.010296	-4.924521868	-0.113094139
2012	Feb	5006.7780	5029.676312	0.793219631	-2.977115687
2012	March	5402.4824	5376.706369	7.903374186	6.899649907
2012	April	5439.7980	5353.041334	0.690712107	-0.440140003
2012	May	5336.9308	5154.341233	-1.891011394	-3.711910463
2012	June	4573.4110	4636.100597	-14.306346260	-10.054449480
2012	July	4882.8450	4881.968930	6.765934660	5.303343343
2012	Aug	5226.0976	5225.066072	7.029766458	7.027843618
2012	Sept	5001.4692	5190.275150	-4.298205223	-0.665846536
2012	Oct	4814.5620	4786.734880	-3.737045906	-7.774930208
2012	Nov	4695.1178	4779.270481	-2.480894420	-0.155939245
2012	Dec	4819.9996	4835.193258	2.659822508	1.170111148
2013	Jan	5052.6032	5150.279649	4.825801230	6.516521139
2013	Feb	5182.0047	5153.683395	2.561085739	0.066088577
2013	March	5067.0888	5071.234501	-2.217595441	-1.599805183
2013	April	4939.6336	5003.011870	-2.515353589	-1.345286473
2013	May	5339.8150	5206.471098	8.101438941	4.066734882
2013	June	5700.2304	5604.933515	6.749585894	7.653214792
2013	July	6360.7959	6249.806207	11.588400010	11.505447660
2013	Aug	7002.7147	6762.058043	10.091799990	8.196283519
2013	Sept	6651.6282	6841.712475	-5.013577092	1.177961384
2013	Oct	6194.2694	6210.347133	-6.875892432	-9.228177072
2013	Nov	5855.9254	5925.446861	-5.462209958	-4.587509624
2013	Dec	6045.2496	6057.008846	3.233036404	2.220287997
2014	Jan	5926.0506	5933.998169	-1.971779627	-2.030881590
2014	Feb	6228.6596	6250.513825	5.106419442	5.333935863
2014	March	6048.0000	6146.621171	-2.900457106	-1.662145811
2014	April	6145.6347	6166.534615	1.614330357	0.323973825

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**Annexure I (Continued)**

2014	May	6044.9688	6051.089739	-1.638006567	-1.872119156
2014	June	6353.7474	6306.952508	5.108026364	4.228375041
2014	July	6272.3745	6159.030596	-1.280707193	-2.345378553
2014	Aug	5938.1754	5860.897462	-5.328111387	-4.840585375
2014	Sept	5771.5632	5682.938663	-2.805781049	-3.036374542
2014	Oct	5185.5360	5171.147451	-10.153699780	-9.005749355
2014	Nov	4714.1380	4667.181949	-9.090632097	-9.745719046
2014	Dec	3737.6416	3736.722289	-20.714209050	-19.936219970

Source : [www.mcxindia.com](http://www.mcxindia.com) for crude oil futures and for spot prices (converted from Dollars to Rupees) [http://tonto.eia.gov/dnav/pet/hist/LeafHandler.ashx? n = PET&s=RBRTE&f=Mion](http://tonto.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RBRTE&f=Mion)