

LINKAGE BETWEEN STOCK AND COMMODITY MARKETS' VOLATILITY IN THE PHILIPPINES

By

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Presented by

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Time Deposit
Money Market
Fund

Stocks
Real Estate



Balanced Funds
Equity UITFs
PAG-IBIG MP2

Commodity Market



Stock Market





The objective of the study is to examine the effect of oil and gold price fluctuations on the volatility of stock markets from the Philippines (PSEi).



- For oil price, from www.indexmundi.com, September 2010 – April 2018
- For gold price, from www.indexmundi.com, September 2010 – April 2018
- PSEi data, from <https://finance.yahoo.com>, January 2000 – May 2018



- Augmented Dickey Fuller Test was employed to test for the unit root.
- Exponential Generalized Autoregressive Conditional Heteroscedasticity (EGARCH) was also employed in order to examine the relationship between commodities like oil and gold to stock market volatility (PSEi)

TABLE 1: Descriptive Statistic of all Commodity Market (Gold and Crude Oil) and Stock Market

	Commodity Price Index	Crude Oil	Gold	PSEi
Mean	184.7049	4389.723	64793.62	42.92163
Median	183.93	4434.68	65231.22	43.18
Maximum	210.37	5047.78	76380.41	44.93
Minimum	150.37	3351.08	53878.43	40.67
Std. Dev.	10.83812	366.8239	6537.54	1.157326
Skewness	-0.6	-0.72659	0.066796	-0.44317
Kurtosis	4.829261	3.537212	1.69512	2.416076
Jarque-Bera	8.575275	4.300632	3.082669	2.018413
Probability	(0.013737)	(0.116447)	(0.214095)	(0.364508)

TABLE 2: Results of the ADF Unit Root Tests

Variables	ADF	
	Intercept	Trend & Intercept
PSEi	-0.008917	-1.048016
Commodity Price Index	0.525607	-0.495577
Crude Oil	0.383129	-0.632160
Gold	-0.042902	-0.887169

TABLE 3: Oil and Gold Price Volatility Modeling

Variable	Mean Equation		Variance Equation	
	Constant	AR (1)	Constant	u_{t-1}^2
log(Crude Oil Price)	0.006751 (0.009173)	0.30777 (0.128395)	0.000642 (0.000649)	0.450584 (0.182070)

Variable	Mean Equation		Variance Equation	
	Constant	AR (5)	Constant	u_{t-1}^2
log(Gold Price)	0.004856 (0.004930)	0.309619 (0.098120)	0.001323 (0.000841)	-0.117834 (0.076104)

Note: Reported values in parentheses are standard error

TABLE 4: Results of EGARCH modeling on the Return of Commodity Prices and Stock Market Indices

	Mean Equation		Variance Equation			
	Constant	AR (1)	C(3)	C(4)	C(5)	C(6)
PSEi	-0.013113 (0.003299)	0.142774 (0.053490)	-0.531026 (0.601225)	0.176576 (0.150809)	-0.011649 (0.086561)	0.926540 (0.097618)
Crude oil	0.00009960 5 (0.009981)	0.005000 (0.094658)	-5.120064 (18.93648)	0.010000 (0.273462)	0.010000 (0.221086)	0.010000 (3.664798)
Gold	0.005431 (0.004860)	0.294133 (0.094428)	-8.305863 (2.989406)	-0.576502 (0.373500)	-0.092674 (0.230124)	-0.258674 (0.430763)

Note: Reported values in parentheses are standard error

TABLE 5: Results of Diagnostic Tests – Oil Price (ARIMA – ARCH Models)
Heteroskedasticity ARCH test on Oil-Price Equation

F-statistic	35314422	Prob. F(27,58)	0.0000
Obs*R-squared	85.99999	Prob. Chi-Square(27)	0.0000
Scaled explained SS	85404325	Prob. Chi-Square(27)	0.0000

Oil-Price Equation	Period	1	2	3	4	5	6	7	8	9	10
	AC	0.325	0.069	-0.104	-0.099	-0.014	0.027	0.069	-0.046	-0.034	0.057
	PAC	0.325	-0.040	-0.128	-0.027	0.040	0.011	0.044	-0.096	0.014	0.102
	Q-statistic	9.9077	10.363	11.404	12.364	12.384	12.456	12.933	13.149	13.266	13.609
	Prob	0.002	0.006	0.010	0.015	0.030	0.053	0.074	0.107	0.151	0.192

TABLE 6: Results of Diagnostic Tests –Gold Price (ARIMA – ARCH Models)
Heteroskedasticity ARCH test on Gold-Price Equation

F-statistic	13546.54	Prob. F(27,62)	0.0000
Obs*R-squared	89.98475	Prob. Chi-Square(27)	0.0000
Scaled explained SS	2360748.	Prob. Chi-Square(27)	0.0000

Gold-Price Equation	Period	1	2	3	4	5	6	7	8	9	10
	AC	0.128	-0.057	-0.088	-0.021	0.274	0.101	-0.007	-0.156	-0.028	-0.030
	PAC	0.128	-0.074	-0.072	-0.004	0.275	0.024	0.000	-0.125	0.033	-0.125
	Q-statistic	1.5386	1.8441	2.5872	2.6290	10.040	11.063	11.068	13.563	13.644	13.736
	Prob	0.215	0.398	0.460	0.622	0.074	0.086	0.136	0.094	0.136	0.185