
Munich Personal RePEc Archive

A good news or bad news has greater impact on the Vietnamese stock market?

Nguyen Van, Phuong

Banking Academy of Vietnam, State Bank of Vietnam

9 January 2015

Online at https://mpra.ub.uni-muenchen.de/61194/
MPRA Paper No. 61194, posted 10 Jan 2015 08:08 UTC

A good news or bad news has greater impact on the Vietnamese stock market?

Nguyen Van Phuong[1]

Banking Academy of Vietnam, State Bank of Vietnam

Abstract

The arrival of news plays an extremely important role in the stock market because it mainly drives the movement of the stock market. In this paper, therefore, we would like to investigate how the Vietnamese stock market responses to the arrival of news via applying the AR – EGARCH in Mean model. Our research result indicates that the arrival of bad news has a greater impact on the conditional volatility than the arrival of good news does. We also found that there exists a positive tradeoff between the stock market returns and conditional volatility in the Vietnamese stock market.

Keyword: The Vietnamese stock market, unit root, ARCH effect, volatility.

JEL Classification: G000, G100

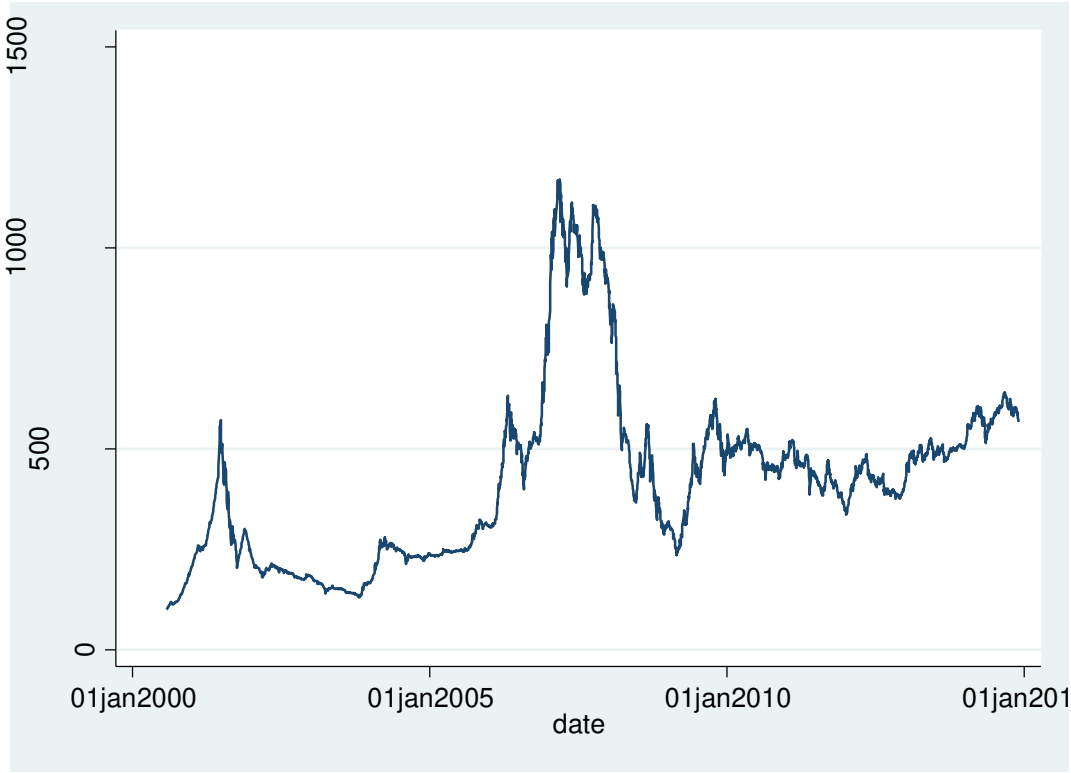
1. Introduction to the Vietnamese stock market

The Vietnamese stock market (VSM) was officially established in 20th, July, 2000 by building the Hochiminh stock exchange (HOSE) center. The

[1] Address: Banking faculty, Banking Academy of Vietnam, State Bank of Vietnam
No.12, Chuaboc Street, Dongda District, Hanoi, Vietnam 100000
Email: phuongnv@hvnh.edu.vn

VNINDEX is well-known as the Vietnamese stock market index. The figure 1 represents the daily movement of the VNINDEX from 2000 to 2014. At the beginning, there were two listed stocks (REE and SAM[2]) and government bonds. The VSM, after that, increased dramatically in 2001 when the VNINDEX reached 571.04 points before plummeting to 200 points. The period between 2002 and 2005, the VNINDEX hovered around 221 points, which did not appeal investors. The insignificant growth of the VSM at this period was mainly associated with a small number of listed stocks and the unwell-known listed companies.

Figure 1: The daily movement of the VNINDEX[3]



[2] REE is Refrigeration Electrical Engineering Corporation and SAM is SACOM Investment and Development Corporation.

[3] Daily data between 28 July 2000 and 28 Nov 2014

From 2006 to 2007, the VSM experienced a significant increase. In 2006, the VNINDEX increased by 144% and total market capitalization reached 13.3 billion USD. Thanks to the Vietnamese Securities Law[4], the VNINDEX rocketed to the highest level of 1,170.6 points in 2007 before plummeting in 2009, which was mainly due to the global financial crisis in 2008. The VNINDEX, then, has hovered around 500 points since 2009.

The arrival of news plays an extremely important role in the stock market because it mainly drives the movement of the stock market. The operation of information disclosure in the VSM is controlled by the State Securities Commission of Vietnam (SSCV) through a wide range of law and regulations: the Vietnamese Securities Law, Regulation No.38/2007/TT – BTC, Regulation No.09/2010/TT – BTC, etc. The listed companies, however, often do not follow these regulations mannerly: the inaccuracy of information concerning the financial report, the delay of the financial report, etc. Furthermore, a unique property of the VSM is that the movement of the market is primarily driven by the arrival of news. This means that almost Vietnamese investors make their investment decision largely based on news, not on the information regarding the real business activities of the listed companies, such as: the financial statements. This property is also common in

[4] The Vietnamese securities law was officially valid from 1 January 2007.

the markets which are at the beginning stage of development. For example, in 2012 the arrival of news about the arrest of "Bau Kien"[5] had the huge impact on the VSM as a whole. The arrival of this news led investors to sell their stock of the listed companies even though the business activities of those listed companies were not actually affected by this event. Consequently, the Vietnamese market value lost 2 billion USD within 2 days after the arrival of this news. Therefore, the purpose of this paper is that we would like to investigate how the VSM responses to the arrival of such kind of news. By applying the AR – EGARCH in Mean model, our research result indicates that the arrival of bad news has a greater impact on the conditional volatility than the arrival of good news. We also found that there exists the positive tradeoff between the stock market returns and conditional volatility in the VSM.

The paper is organized as follows: The Section Two introduces the literature review. The Section Three represents the data and methodology. The Section Four Section four gives the result and discussion. The Section Five shows the conclusion of this paper.

[5] BAU KIEN is one of Vietnam's richest and most flamboyant businessmen. He is one of the founders of Asia Commercial Joint Stock Bank (ACB), one of the Vietnam's biggest banks. He is also shareholder in other commercial banks: Kien Long Commercial Joint Stock Bank and the Vietnam Export – Import Commercial Joint Stock Bank. He arrested for "economic violations"

2. **Literature review**

The volatility models recently have been widely used for modeling the volatility of an asset return because volatility reflects the conditional standard deviation of the underlying asset return. Moreover, there are four main financial applications of volatility models (Tsay, 2005). Firstly, we can apply them to compute value at risk (Var) of a financial asset. Secondly, they provide a tool to allocate asset under the mean-variance framework. Thirdly, the efficiency in estimated parameters and the accuracy in forecast can be improved by applying the volatility models for a time series. Finally, the trading of the volatility index of stock market has widespread used in the World.

It has been well-known that we cannot directly observe the stock volatility. However, we can see some characteristics of the stock volatility: the existence of volatility cluster, the stationary of volatility, and the leverage effect. These characteristics enable us to develop the volatility model. The first model, which was developed by Engle (1982), is Autoregresive Conditional Heteroscedasticiy (ARCH). The basic properties of ARCH model is that although the shock of an asset return is not serial correlation, it is assumed to depend on square of its lagged value. The drawback of the ARCH model is that there are many parameters needed to capture fully the volatility

of the financial asset return. To solve this problem, the Generalised ARCH (GARCH), which was developed by Bollerslev (1986), can be applied. Both ARCH and GARCH models, however, have the common weakness that a positive shock has the same impact on the volatility of the financial asset return as a negative shock. To overcome this weakness, Nelson (1991) develops the Exponential GARCH (EGARCH) model, in which allows for asymmetric impact between a positive and negative shock on the volatility of the asset return. Therefore, to evaluate how the Vietnamese stock market responses to the arrival of news, we will apply the EGARCH model. Moreover, to investigate the tradeoff between the financial asset return and its volatility in the Vietnamese stock market, we will apply the EGARCH in Mean (EGARCH-M) model.

In comparison with the stock markets in the World, the VSM is still the young one with 14-year development. Thus, to best our knowledge, there are rarely deep studies about the asymmetry volatility of financial asset return and the existence of a risk premium in the VSM. Therefore, this research would be the first one, which examines the asymmetric impacts between a positive and negative shock on the volatility of the asset return and the existence of a risk premium in the VSM as well.

3. Data and methodology

3.1. Data

The daily data concerning the close price of the VNINDEX was collected from SSCV. Then, the return of the VSM is computed as follows:

$$Return\ (r) = 100 * [\log(VNINDEX_t) - \log(VNINDEX_{t-1})]$$

The table 1 reports the statistical descript about the return of the VSM. We saw that the mean of return is -0.051%. The negative return on the average is mainly associated with the downward trend of VNINDEX. Especially, since 2008 the VSM has not been considered as one of the attractive investment channel for the investors because it was impacted by the global crisis (2008) and, the European public debt crisis (2010).

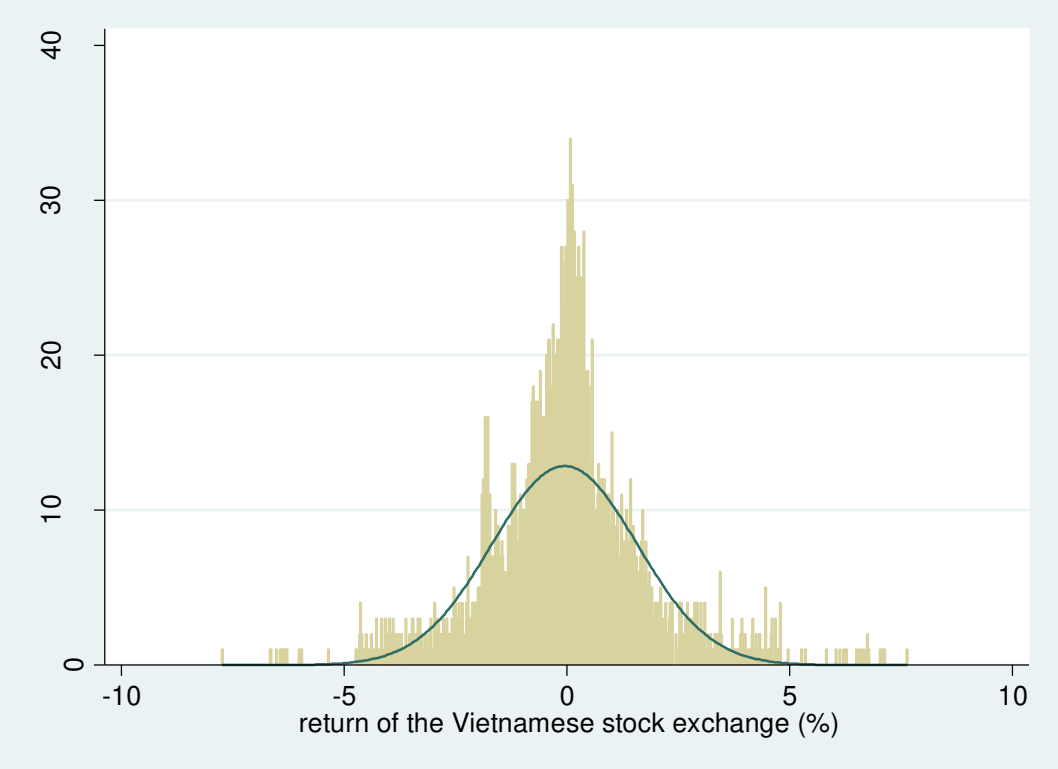
Table 1: Statistical descript

No. observation	3419
Mean	-0.051
Standard deviation	1.634
Skewness	0.2199
Kurtosis	5.593
Min	-7.741
Max	7.656

Figure 2 represents the histogram of the stock return in the Vietnamese market. We see that the distribution of the Vietnamese stock return can be

approximated to the normal distribution according to the Central Limit Theorem. However, the positive Skewness of 0.22 indicates that the risky level in the Vietnamese stock market is low. On the other hand, the Kurtosis is 5.6, which is higher than 3. It means that the risky level is high in the VSM.

Figure 2: Histogram of the stock return



3.2. Econometric model

We assume that the conditional variance follows an EGARCH process (Nelson, 1991). The EGARCH model allows for conditional variance to respond asymmetrically to the return shocks. A AR(h) - GARCH (p,q) in Mean model is given by:

$$r_t = \emptyset_0 + \sum_{j=1}^{h} \emptyset_j r_{t-j} + \gamma \sigma_t^2 + \epsilon_t \quad (1)$$

and: ϵ_t *is the residual of the mean equation*

r_t *denotes the return of the asset at time t*

Nelson (1991) modified ϵ_t or the residuals of the mean equation such that:

$$\frac{\epsilon_t}{\sigma_t^2} = z_t$$

Where $z_t \sim iid\ (0,1)$ and is called the standardized residuals

Then, the EGARCH variance equation becomes

$$\ln(\sigma_t^2) = \alpha_0 + \sum_{j=1}^{q} \alpha_j \left[\left| z_{t-j} \right| - E\left| z_{t-j} \right| \right] + \sum_{j=1}^{q} \delta_j z_{t-j} + \sum_{i=1}^{p} \beta_i \ln(\sigma_{t-i}^2) \quad (2)$$

For the standard Gaussian random variable z_{t-j}, $E\left|z_{t-j}\right|\ as\ \sqrt{2/\pi}$. Then, the equation (2) can be rewritten as:

$$\ln(\sigma_t^2) = g(z_t) + \sum_{i=1}^{p} \beta_i \ln(\sigma_{t-i}^2) \quad (2')$$

Where: $g(z_t) = \alpha_0 + \sum_{j=1}^{q} \alpha_j \left[\left| z_{t-j} \right| - \sqrt{2/\pi} \right] + \sum_{j=1}^{q} \delta_j z_{t-j}$

Equation (1) is called the mean equation and exhibits the AR(h) model. On the other hand, the equation (2') is called the equation for the conditional variance. Based on the equation (2'), we can see the two different points between the EGARCH model and the GARCH model. Firstly, tt uses the logged conditional variance to relax the positiveness constraint of model parameters. Secondly, applying $g(z_t)$ enables the EGARCH model to respond asymmetrically to positive and negative lagged value of ϵ_t.Moreover, the δ_j parameters signify the leverage effect[6] of ϵ_t . We expect δ_j to be negative in real applications.

[6] The "leverage effect" indicates the relationship between stock return and it volatility: volatility rises when the stock price declines.

Overall, the EGARCH model uses the natural logarithm of the conditional variance to relax the positiveness constraint of the model's coefficients and to allow for the persistence of shocks to the conditional variance.

4. Result and discussion

4.1. Preliminary estimation

Before estimating the AR – EGARCH in Mean model, there are several preliminary conditions that we need to do. First of all, we conduct the unit root test for the stock return in Vietnam. We take a look at the Figure 3, which shows that the stock returns fluctuate around zero. It implies that the stock returns are stationary. We also conduct the augmented Dickey – Fuller (ADF) test to examine whether the stock returns in AR – EGARCH in Mean model are stationary. The ADF test results show that the stock returns are stationary at the significant level of 5 % (See the Table 2).

Figure 3: the movement in the stock return in Vietnam

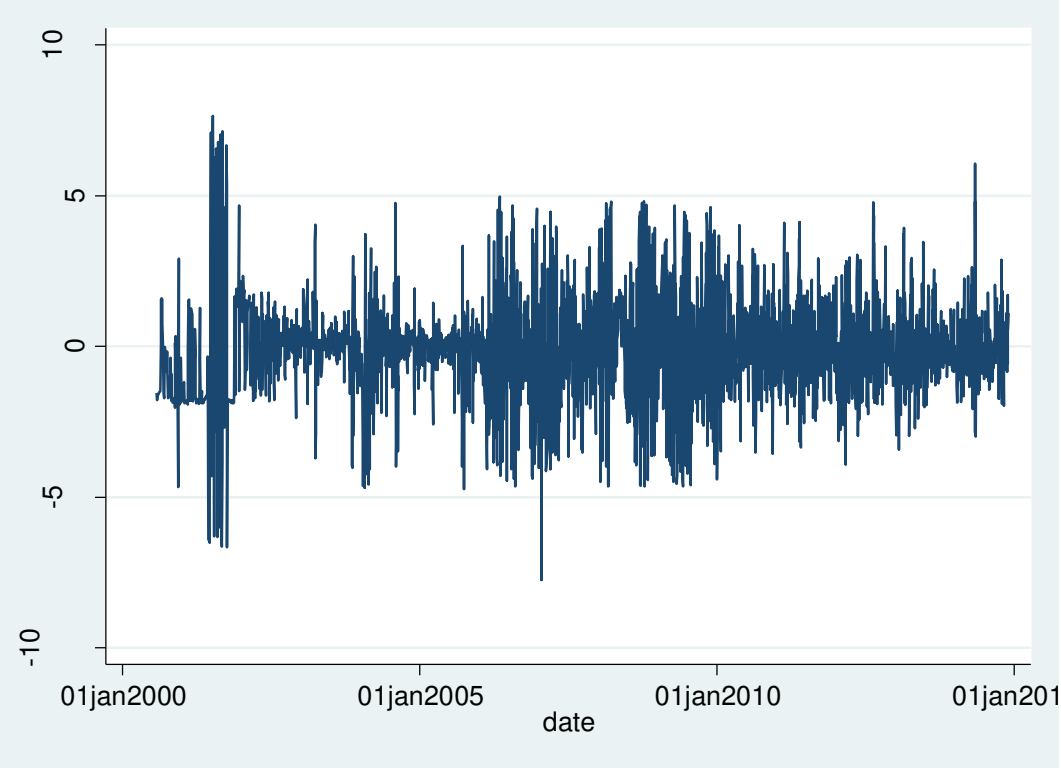


Table 2: the unit root test report

Test statistic	**Interpolated Dickey – Fuller**		
	1% critical value	***5% critical value***	***10% critical value***
-42.754	-3.430	-2.860	-2.570

Another preliminary analysis, we examine whether there exists ARCH effect. Thus, we conduct the Lagrange multiplier test of Engle (1982). The test result indicates strong ARCH effects with test statistic $F \approx 1035$, the p – value of which is zero (See the Table 3).

Table 3: The ARCH effect test

Lags	Chi2	Degree of freedom	P-value
10	1035.308	10	0.000
Ho: No ARCH effect vs H1: ARCH(p) disturbance			

Given that the stock returns are stationary and there exists ARCH effect, the AR – EGARCH in Mean model can be estimated to investigate the asymmetric impacts between a positive and negative shock on the volatility of the asset return in Vietnam.

4.2. Identifying AR – EGARCH in Mean model

To identify the order of mean equation, we apply the partial autocorrelation function (PAC) approach[7]. Based on the table 4, using the 5% significant level, we identify an AR(1) as mean equation in the volatility model.

Table 4: The partial autocorrelation function for the daily stock return

Lag	1	2	3	4	5	6
PACF	0.3027	-0.0480	0.0233	0.0927	0.0951	0.0335
Lag	7	8	9	10	11	12

[7] Another approach for determining the order of the AR model is to use some information criteria: AIC () and BIC ()

PACF	0.0183	0.0061	0.0044	0.0150	0.0286	-0.0096

On the other hand, specifying the order of a EGARCH model is not so easy. In practice, Tsay (2010) proposes that only lower order EGARCH model are applied in most application: EGARCH(1,1), EGARCH(1,2), and EGARCH (2,1). However, the parameter of ARCH part is not statistically significant at the 5% level in these three models on the Vietnamese data (See the Appendix). We find the EGARCH model with the first –order lag length in ARCH part and the second – order lag length of GARCH part fits the Vietnamese data well. Therefore, the identified model is the AR(1) – EGARCH (1,2) in Mean model and the estimated result is reported as follows:

$$r_t = -0.131 \;+\; 0.313\, r_{t-1} \;+\; 0.078\sigma_t^2 + \; a_t \quad (3)$$

Se (0.043)*** (0.012)*** (0.018)***

$$\ln(\sigma_t^2) = 0.072 - 0.029 z_{t-1} + 0.177(|z_{t-1}| - \sqrt{\frac{2}{\pi}}) + 0.895 \ln(\sigma_{t-2}^2) \quad (4)$$

Se (0.006)*** (0.006)*** (0.01)*** (0.007)***

where $z_t = \frac{a_t}{\sigma_t}$, which is distributed as N(0,1) .

4.3. Empirical result analysis

The parameters in the estimated mean equation in (3) are statistically significant at the 1 % level. The change of 1% in stock return in previous day leads current stock return to a rise by 0.313%. The estimated risk premium of 0.078 for the stock return in Vietnam is positive. It implies that the return is positively related to its volatility. Moreover, the existence of risk premium is one of the reasons that the historical stock return in Vietnam has serial correlation. The finding result of the existence of a positive risk premium in the VSM is not consistent with some previous studies that showed a negative tradeoff between stock return and its volatility, but statistically insignificant (Nelson, 1991; Campell and Hentschel, 1992).

The estimated parameter of z_{t-1} is -0.029, which is consistent with our expectation. It implies that there is existence of the leverage effect in the VSM.

The coefficient $of\ \left[|z_{t-1}| - \sqrt{2/\pi}\right]$ with a value of 0.177 in the equation (4) is statistically significant at the 1% level. The positive coefficient implies that the shocks (positive or negative) have destabilizing effects on the volatility of stock returns in the Vietnamese stock market.

From the estimated volatility equation in (4) and using $\sqrt{2/\pi} \approx 0.7979$, we obtain the volatility equation as:

If $z_{t-1} \geq 0$:

$$\ln(\sigma_t^2) = -0.069 + 0.148 z_{t-1} + 0.895 \ln(\sigma_{t-2}^2) \quad (4.1)$$

If $z_{t-1} < 0$:

$$\ln(\sigma_t^2) = -0.069 - 0.206 z_{t-1} + 0.895 \ln(\sigma_{t-2}^2) \quad (4.2)$$

Taking antilog transformation in equation (4.1) and (4.2), we have:

If $z_{t-1} \geq 0$: $\sigma_t^2 = e^{-0.069} e^{0.0148 x z_{t-1}} \sigma_{t-2}^{2x0.895}$ (4.3)

If $z_{t-1} < 0$: $\sigma_t^2 = e^{-0.069} e^{-0.206 x z_{t-1}} \sigma_{t-2}^{2x0.895}$ (4.4)

We assume a standardized shock with magnitude 2 (two standard deviations), then, dividing both sides of equation in (4.4) by both sides of equation in (4.3), we have:

$$\frac{\sigma_t^2(z_{t-1} = -2)}{\sigma_t^2(z_{t-1} = 2)} = \frac{\exp[-0.206x(-2)]}{\exp[0.0148x2]} = e^{0.1912} \approx 1.211$$

Thus, the impact of a negative shock of size 2 standard deviations is about 21.1% higher than that of a positive shock of the same size. In short, the bigger the shock, the larger the difference in volatility impact in the VSM.

5. Conclusion

The VSM is treated as one of the emerging market with 14-year development in the World. Thus, the movement of market cannot reflect completely the current health of the Vietnamese economy as a whole. The movement of the VSM has been largely caused by arrival of news which may

not be related to the listed companies' real business activities. Evaluating the impact of arrival of news on the VSM becomes necessary for all members in the market. In this paper, by applying the AR – EGARCH in Mean model, we find that the arrival of bad news has a greater impact on the conditional volatility than the arrival of good news. Moreover, our finding indicates that there exists the positive tradeoff between the stock market returns and conditional volatility in the VSM.

References

Engle, R.F. (1982). "Autoregressive conditional heteroscedasticity with estimates of the variance of U.K. inflation." *Econometrica, Vol* 50, 987–1008.

Bollerslev, T. (1986). "Generalized autoregressive conditional heteroskedasticity". *Journal of Econometrics, Vol.31, p.307 – 327.*

Campbell, J. and Hentschel, L (1992). "No news is good news: an asymmetric model of changing volatility and stock returns". *Journal of financial economics, Vol. 31, p.281 – 318.*

Nelson, D. (1991). "Conditional heteroscedasticity in asset returns: a new approach." *Econometrica* , *Vol 59, p. 347–370.*

Engle and Ng. (1993). "Measuring and Testing the impact of news on volatility". *Journal of finance, Vol 48, No.5, pp 1749-1778.*

Tsay, Ruey S. (2010). "Analysis of financial time series", third edition, p.29 – 54 & p109 – 147, *Johnson Willey & Sons.*

APPENDIX

Table 4: The estimated AR – EGARCH in Mean model

Parameter	AR(1) – EGARCH (1,1)	AR(1) – EGARCH (1,2)	AR(1) – EGARCH (2,1)
$\emptyset_0$	-0.0009 (0.0211) [0.9670]	0.0039 (0.0211) [0.8530]	0.0035 (0.0211) [0.8700]
$\emptyset_1$	0.2619 (0.0165) [0.0000]	0.2705 (0.0169) [0.0000]	0.2795 (0.0171) [0.0000]
γ	-0.0089 (0.0155) [0.5640]	-0.0123 (0.0169) [0.0000]	-0.0145 (0.0159) [0.3620]
α_0	0.0338 (0.0050) [0.0000]	0.0377 (0.0060) [0.0000]	0.0259 (0.0039) [0.0000]
α_1	-0.0158 (0.0147) [0.2830]	-0.0203 (0.0174) [0.2430]	-0.0254 (0.0249) [0.3070]
α_2			0.0115 (0.0223) [0.3070]
δ_1	0.4512 (0.0202) [0.0000]	0.5185 (0.0303) [0.0000]	0.5511 (0.0339) [0.0000]
δ_2			-0.1869 (0.0337) (0.0000)
β_1	0.9485 (0.0046) [0.0000]	0.6810 (0.0634) [0.0000]	0.9624 (0.0037) [0.0000]
β_2		0.2628 (0.0616) [0.0000]	

( ): Standard error; [ ]: p - value