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THE EFFECTS OF INTERNATIONAL ACCOUNTING STANDARDS ON STOCK MARKET VOLATILITY: THE CASE OF GREECE

Christos Floros*

Abstract

The adoption of International Accounting Standards (IAS) by the European Union (which started in 2005) is one of the biggest events in the history of financial accounting. This paper investigates the effects of adopting IAS on Greek stock market volatility. We consider daily data (covering the period 2003-2005) from four major indices of the Athens Stock Exchange (ASE): the General ASE index, FTSE/ASE-20, FTSE/ASE Mid 40 and FTSE/ASE Small Cap 80. We find that the introduction of IAS has a negative – but not significant – effect on Greek stock market volatility. This is confirmed by estimation of three different types of GARCH specifications. In addition, the unconditional variance indicates lower market volatility after the introduction of IAS in Greece for all indices. These findings are helpful to financial managers dealing with Greek stock indices.

Key words: IAS, ASE, GARCH, Volatility.
JEL Classification: G14, M40.

I. Introduction

From 2005 all companies, that are listed on a European regulated Stock Exchange, must prepare their consolidated financial statements based upon International Financial Reporting Standards (IFRS). They will no longer be able to produce accounts based upon national GAAP.

The main reason for this is that EU wants to develop a single capital market. So, one element of this is to have a common 'language' (i.e. accounting standards) for the financial information provided to that single market; what is called "international accounting standards" (IAS)[1].

The main requirement to adopt IAS/IFRS applies only to those companies that are active direct participants in the capital market. In simple words, those that have securities that are publicly traded on recognised European stock markets. Therefore, any listed company in the EU that meets the above definition must prepare consolidated financial statements using IAS/IFRS for accounting periods commencing on after 1 January 2005.

The International Accounting Standards Board (IASB) has proposed 41 standards in order to converge the accounting practices among the countries within the EU. The main purpose of the standards is to upgrade the quality of financial statements and, of course, increase the degree of comparability. Some of the potential benefits to a company are:

- Better information for strategic decision-making and enhanced risk management analysis
- Streamlined reporting systems and quicker publication of results at the period end
- Redesigned processes to capture external and internal data as well as regulatory requirements
- Greater confidence in reporting data on future prospects and an improved reputation with investors and analysts

This paper examines the effects of IAS on Greek stock market volatility. Volatility is one of the most important concepts in finance. It can be measured as standard deviation or variance of series, and is often used as a crude measure of the total risk of financial assets.

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[1] The distinction between IFRS and IAS is that all existing standards are called IAS, while all future (new) standards will be called IFRS.

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We consider daily data from four major indices of the Athens Stock Exchange (ASE). The main objective of this research paper is to identify any (positive/negative) effect of IAS using General Autoregressive Conditional Heteroskedastic (GARCH) volatility models. Our findings are very important since no previous work has examined the effect of IAS on the Greek stock indices of the ASE.

The remainder of the paper is as follows: In section 2 the literature review is presented. In section 3 the methodology and data employed are presented. Also, in section 4, the results from the empirical investigation are reported. In the final section (section 5) summary and conclusions are drawn.

II. Literature Review

Market observers, researchers and regulators argue that financial statements prepared under the shareholder or investor model, such as IAS, provide better information than financial statements prepared under the stakeholder model (national GAAP). According to Schipper (2005), the EU adoption of IFRS in 2005 offers some elements of research designs. The EU offers considerable differences in financial reporting incentives.

Firstly, Taylor (1987) examines the rationale behind the International Accounting Standards Committee (IASC). The paper represents an attempt to explain why we do have an organization such as the IASC. He reports that that rationale is likely to have significantly greater explanatory power in respect of the output produced by the IASC than those traditionally presented.

Flower (1998) analyses the implications of the EUs proposal to permit large multinational corporations to present their consolidated accounts in accordance with the IAS of the IASC. He concludes that it is improbable that the American SEC will accept the IAS for listing purposes on Wall Street.

El-Gazzar *et al.* (1999) examine the underlying motivations and characteristics of firms complying with IAS. Their results indicate that the magnitude of a firm's foreign operations, its financing policy, membership of certain geographical and trade blocks in the EU, and multiple listing of foreign stock exchanges are significantly associated with multinationals' compliance with IAS.

Eccher and Healy (2000) investigate the usefulness of IAS in a transitional economy, the People's Republic of China (PRC). They conclude that information produced using IAS is no more useful than that prepared using Chinese standards. For stocks that can only be owned by international investors, IAS and PRC earnings and accruals have a similar association with annual stock returns, while for stocks that can be owned only by domestic investors, PRC earnings have a higher relation with annual stock returns than IAS earnings.

Hung and Subramanyam (2004) explain the effects of adopting IAS on financial statements and their value relevance for a sample of German firms during 1998-2002. They compare accounting numbers reported under German rules (HGB) with those under IAS. They find that total assets and book value of equity, as well as variability of book value and net income, are significantly higher under IAS than HGB. Also, book value (net income) plays a greater (lesser) valuation role under IAS than under HGB.

III. Methodology and Data

Empirical studies (Harris, 1989; Lockwood and Lin, 1990) analyse whether there is a positive/negative effect on stock market volatility (conditional variance) using the standard GARCH (1,1) model or the GJR model (developed by Glosten, Jagannathan and Runkle in 1993) which tests for the presence of asymmetries. Harris (1989) reports that the volatility of S&P 500 stocks increased, relative to the volatility of stocks. Lockwood and Linn (1990) find that stock market volatility has increased after the stock index futures trading. Engle and Ng (1993) define the news impact curve which measures how new information is incorporated into volatility estimates. New diagnostic tests are presented which emphasize the asymmetry of the volatility response to news. Their results suggest that the GJR model is the best parametric model, while Exponential GARCH (EGARCH) can capture most of the asymmetry.

Here, to analyse the effect of IAS on stock market volatility of the ASE, a variant of the GARCH models is employed.

Financial research shows much evidence that returns characterized by leptokurtosis (i.e. if the kurtosis exceeds 3, the distribution is peaked or leptokurtic relative to the normal), skewness (i.e. a measure of asymmetry of the distribution of the series around its mean) and volatility clustering (i.e. large changes in prices tend to be followed by large changes, of either sign, and small changes tend to be followed by small changes). A usual way to capture the above stylised facts is to model the conditional variance as a (G)ARCH process. First, Engle (1982) proposes an ARCH model in order to capture for modelling the time-variance. He introduces the ARCH (p) time series models for modelling the time-varying volatility clustering phenomenon. Then, Bollerslev (1986) extends ARCH model including past variances as well as past forecast errors. This model is referred to as GARCH (p,q) model. The GARCH (p,q) model captures the tendency in financial data for volatility clustering, and also, it incorporates heteroskedasticity into the estimation procedure. In this model, positive and negative past values have a symmetric effect on the conditional variance. The most parsimonious representation is GARCH (1,1) model.

We examine if the existence of IAS has any effect on volatility by using an autoregressive of order one as a mean equation, while we also use a conditional variance equation with a dummy variable (taking the value zero for pre-IAS period and one for post-IAS period).

The AR(1)-GARCH (1,1) model, for returns R and prices P, can be expressed as follows:

$$\begin{aligned} R_t &= c + R_{t-1} + \varepsilon_t, \text{ where } R_t = \ln(P_t) - \ln(P_{t-1}) \\ \sigma_t^2 &= \omega + a\varepsilon_{t-1}^2 + b\sigma_{t-1}^2 + cD_i + e, \end{aligned} \tag{1}$$

where c is a constant term in the mean equation, R is defined as $R_t = \ln(P_t) - \ln(P_{t-1})$, ω is the constant term in the conditional variance equation, a is the ARCH coefficient and b is the GARCH coefficient. The dummy variable D_i takes the value zero for the pre-IAS period (1/1/2003-31/12/2004) and one for the post-IAS period (1/1/2005-20/12/2005). The dummy allows us to determine whether the adoption of IAS could be related to any change in the stock market volatility. When the coefficient of the dummy variable is positive (negative) then there is a positive (negative) effect of IAS on volatility.

In addition, assuming that markets are efficient, then α (the ARCH parameter) can be viewed as a 'news/announcement' coefficient, while b (the GARCH parameter) can be viewed as 'old news/announcement' and persistence coefficient. Further, an increase (decrease) in a suggests that news is impounded into prices more rapidly (slowly). A reduction in b suggests that old news has a less persistent effect on prices changes. In addition, an increase in b suggests greater persistence. Also, when the sum $a+b$ approaches unity then the volatility shocks are persistent.

Other specifications of the GARCH (p,q) include the exponential GARCH (EGARCH) and threshold GARCH (TGARCH). Both models capture volatility asymmetry.

- EGARCH (1,1) model

The conditional variance equation of the Exponential GARCH (1,1) model (Nelson, 1991) is given by:

$$\log\ (\sigma_t^2) = \omega + b\log(\sigma_{t-1}^2) + a\left|\frac{\varepsilon_{t-1}}{\sigma_{t-1}}\right| + \gamma\frac{\varepsilon_{t-1}}{\sigma_{t-1}} + cD_i. \tag{2}$$

The main difference with the GARCH model proposed by Bollerslev (1986) is that the leverage effect now is exponential and also that the variances are positive. The presence of leverage effects can be tested by the hypothesis that $\gamma < 0$. The impact is asymmetric if $\gamma \neq 0$.

- TGARCH (1,1) model

The model is introduced by Zakoian (1990) and Glosten, Jagannathan and Runkle (1993). TGARCH usually accounts for the fact that traders react differently to positive and negative increments of a factor. The conditional variance equation of TGARCH (1,1) is given by:

$$\sigma_t^2 = \omega + \alpha\varepsilon_{t-1}^2 + \gamma\varepsilon_{t-1}^2 d_{t-1} + b\sigma_{t-1}^2 + cD_i. \quad (3)$$

Either good news (ε_{t-1}>0) or bad news (ε_{t-1}<0), all have an impact on α and $\alpha+\gamma$ respectively. In other words, a negative innovation (shock) has a greater impact than a positive innovation on volatility. Also when γ > 0, bad news increases volatility, and the leverage effect exists. When $\gamma \neq 0$ and significant then the news impact is asymmetric.

To estimate the above GARCH-type models the Marquardt algorithm with the Heteroskedasticity Consistent Covariance option under the *EViews* program is employed. We also filter conditional mean structure in the data using the AR (1) model (for all GARCH specifications and indices). This order is determined by the AIC.

- Data description

Daily closing prices for the General ASE index, FTSE/ASE-20 index as well as FTSE/ASE Mid 40 and FTSE Small Cap 80 indices are used over the period of 2003-2005. The FTSE/ASE-20 index is a large capitalisation index which includes the 20 largest companies listed on the ASE. The FTSE/ASE Mid 40 index focuses on companies of middle capitalisation and comprises 40 such companies, ranked by capitalisation. The next 80 largest companies by capitalisation are included in the FTSE/ASE Small Cap 80 index. All data were obtained from the *Datastream* and the official web page of the Athens Stock Exchange (www.ase.gr).

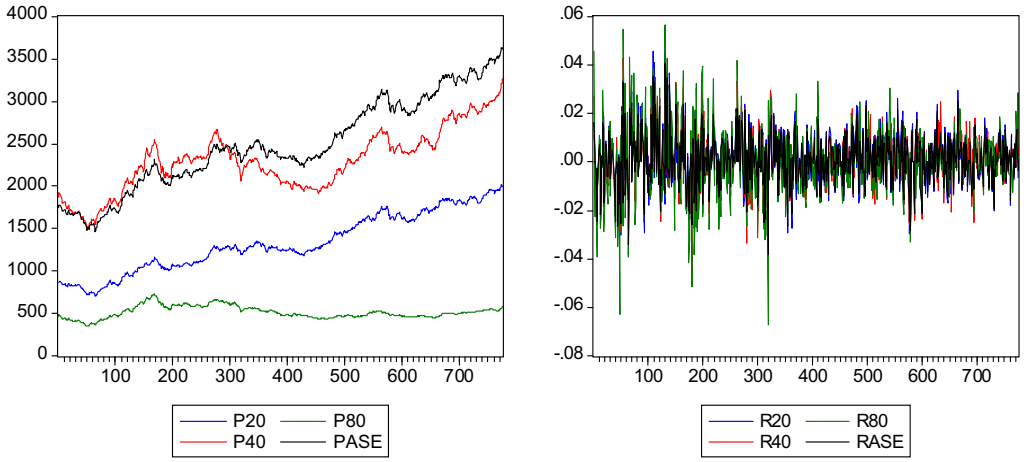
Table 1 gives the descriptive statistics for daily returns of Greek stock market indices. The daily returns are between 0.0002 and 0.001. The negative (positive) value for skewness indicates that the series distribution is skewed to the left (right). The values for kurtosis are high for all indices. So, we find that prices show excess kurtosis (i.e. leptokurtic pdf), implying fatter tails than a normal distribution. The Jarque-Bera test rejects normality at the 5% level for all distributions. Also, all log-prices are non-stationary I(1), while all returns are stationary I(0). The data are plotted in levels (P) and returns (R) in Figure 1. Figure 1 also shows the fluctuation of the returns and confirms the volatility clustering fact.

Table 1

Descriptive Statistics for the Returns of the Series

	FTSE/ASE-20	ASE GENERAL	FTSE/ASE-80	FTSE/ASE MID 40
Mean	0.001083	0.000938	0.000282	0.000715
Median	0.000720	0.000421	0.000000	0.000181
Maximum	0.045822	0.041005	0.056501	0.042702
Minimum	-0.039615	-0.038387	-0.067320	-0.048991
Std. Dev.	0.010991	0.009851	0.013522	0.010933
Skewness	0.088936	0.019115	0.020263	-0.037117
Kurtosis	4.325298	4.223623	5.748089	4.570388
Jarque-Bera	57.66469	48.33353	243.6047	79.71002
Probability	0.000000	0.000000	0.000000	0.000000
Sum	0.838190	0.725823	0.217976	0.553577
Sum Sq. Dev.	0.093378	0.075009	0.141328	0.092395
Observations	774	774	774	774
ADF (Level)	-0.368957	-0.216555	-1.678804	-0.385410
ADF (1st diff.)	-25.33241	-25.52293	-13.53714	-13.62228

Notes: Skewness is a measure of asymmetry of the distribution of the series around its mean.
Kurtosis measures the peakedness or flatness of the distribution of the series.
Jarque-Bera is a test statistic for testing whether the series is normally distributed.
ADF regressions include intercept but not trend.
We employ ADF test on the logarithms of stock indices.



Notes: P 20: Closing price of FTSE/ASE 20 index, R 20: Return on FTSE/ASE 20 index
P 40: Closing price of FTSE/ASE Mid 40 index, R 40: Return on FTSE/ASE Mid 40 index
P 80: Closing price of FTSE/ASE Small Cap 80 index, R 80: Return on FTSE/ASE Small Cap 80 index
PASE: Closing price of General ASE index, RASE: Return on General ASE index

Fig. 1. Plot of Prices (P) in levels and Returns (R)

Next, we report the main statistics (mean and standard deviations) of the returns for the sub-periods before and after the adoption of IAS in Greece. Table 2 contains information for all indices. It is clear from the standard deviations that daily standard deviations changed little. For both periods before and after the introduction of IAS the s.d.'s fall slightly. That means, the adoption of IAS may not destabilize the Greek stock market. However, a more detailed empirical investigation needs to be carried out by using GARCH-family models.

Table 2

Statistics for daily returns (R)

A. General ASE index			
Sample Period	**N**	**Mean**	**S.d.**
Pre-IAS	522	0.000893	0.010535
Post-IAS	252	0.001031	0.008273
B. FTSE/ASE-20 index			
Sample Period	**N**	**Mean**	**S.d.**
Pre-IAS	522	0.001117	0.011757
Post-IAS	252	0.001013	0.009224
C. FTSE/ASE Mid 40 index			
Sample Period	**N**	**Mean**	**S.d.**
Pre-IAS	522	0.000400	0.011893
Post-IAS	252	0.001369	0.008596
D. FTSE Small Cap 80 index			
Sample Period	**N**	**Mean**	**S.d.**
Pre-IAS	522	2.28e-05	0.015410
Post-IAS	252	0.000818	0.008351

IV. Empirical Results

Selecting the GARCH model by using the AIC value, the best representation for all indices is the AR (1)-GARCH (1,1) model and its extensions, AR (1)-EGARCH (1,1) and AR (1)-TGARCH (1,1). In Table 3 all the GARCH family models with a dummy variable are reported. As can been seen, there is a negative coefficient on dummies for all cases. The negative effect is not statistically significant, and therefore, there is not a significant decrease in volatility associated with IAS adoption.

Hence, the results presented in Table 3 show that the introduction of IAS in Greece has no effect on the volatility of the Greek stock market. Our next step is to examine and compare the values of the volatility parameters for the pre-IAS and the post-IAS periods. The results from all GARCH-family models are presented in Table 4 for the pre-IAS period and Table 5 for the post-IAS period. It is very clear that most of the ARCH and GARCH parameters are statistically significant at the 5% level in the pre-IAS period.

Table 3

The effect of IAS on stock market volatility

A. General ASE index		
MODEL	COEFF. ON DUMMY	T RATIO
AR(1)-GARCH(1,1)	-7.19e-07	-0.950089
AR(1)-EGARCH (1,1)	-0.022048	-1.491670
AR(1)-TGARCH(1,1)	-8.01e-07	-0.996438
B. FTSE/ASE-20 index		
MODEL	**COEFF. ON DUMMY**	**T RATIO**
AR(1)-GARCH(1,1)	-9.61e-07	-0.998458
AR(1)-EGARCH (1,1)	-0.014481	-1.314646
AR(1)-TGARCH(1,1)	-9.87e-07	-1.009254
C. FTSE/ASE Mid 40		
MODEL	**COEFF. ON DUMMY**	**T RATIO**
AR(1)-GARCH(1,1)	-2.25e-06	-1.326916
AR(1)-EGARCH (1,1)	-0.039664	-1.530277
AR(1)-TGARCH(1,1)	-2.74e-06	-1.438177
D. FTSE Small Cap 80 index		
MODEL	**COEFF. ON DUMMY**	**T RATIO**
AR(1)-GARCH(1,1)	-1.27e-06	-1.205668
AR(1)-EGARCH (1,1)	-0.018820	-1.403513
AR(1)-TGARCH(1,1)	-2.08e-06	-1.524569

Notes: We report the results from the coefficient on dummy variable only.

According to Table 4, all parameters in AR (1)-GARCH (1,1) are non-negative (and statistically significant) indicating that the GARCH (1,1) models are well specified[1]. Therefore, there have been significant changes in volatility structure of stock market after the introduction of IAS in Greece. In addition, the evidence from AR (1)-GARCH (1,1) indicates an increase in ARCH parameter which suggests that news is impounded into prices more rapidly. Also, a decrease in the GARCH parameter suggests that old news have a less persistent effect on price changes. Therefore, old news will have less impact on today's price changes. The sum of the coefficients a and b (General ASE index) changes from 0.9774 (pre-IAS) to 0.47085 (post-IAS) for the AR (1)-

[1] The GARCH (1,1) model has been found to be the most parsimonious representation of conditional variance that best fits many financial series (see Bollerslev, 1987).

GARCH (1,1), and from 0.976812 (pre-IAS) to 0.4948 (post-IAS) for the FTSE/ASE-20 index. Hence, the persistence of shocks from the pre-IAS period to the post-IAS period is reduced indicating market efficiency. This is also confirmed by the reduction of the GARCH parameter (b). This result is also applied to the other two indices, FTSE/ASE Mid 40 and FTSE/ASE Small Cap 80. Appendix 1 and Appendix 2 show the plots of conditional variance series (resulting from the above models) before and after the introduction of IAS, respectively.

Furthermore, for the AR (1)-EGARCH (1,1) model, there is a decrease in a parameter (the only exception is FTSE/ASE Small Cap 80 index). Also, the leverage effect term is negative. In pre-IAS period, the leverage effect term is statistically different from zero indicating the existence of the leverage effect in stock returns during the sample period (only for the General ASE and FTSE/ASE-20 indices). In post-IAS period, the leverage effect term is not significant. In addition, we find an increase in b parameter for the General ASE and FTSE/ASE-20 indices, and a decrease in b parameter for FTSE/ASE Mid 40 and FTSE/ASE Small Cap 80 indices. Furthermore, the results from the AR (1)-TGARCH (1,1) models show a decrease in a parameter and decrease in b parameter. So, new news is impounded into prices slowly, while old news has a less persistent effect on price changes. Also, the leverage effect is not significant.

Table 4

Estimation Results of GARCH Models (Pre-IAS Period)

A. General ASE index				
MODELS	**ω**	**α**	**γ**	**B**
AR(1)-GARCH(1,1)	2.47e-06 (1.22033)	0.056777 (2.646945)*		0.920656 (27.46202)*
AR(1)-EGARCH	-7.993399 (-1.639048)	0.035733 (0.393270)	-0.152835 (-2.203115)*	0.127103 (0.237699)
AR(1)-TGARCH(1,1)	2.68e-06 (1.251245)	0.053374 (2.149072)*	0.013310 (0.395573)	0.915750 (26.91219)*
B. FTSE/ASE-20 index				
MODELS	**ω**	**α**	**γ**	**b**
AR(1)-GARCH(1,1)	3.21e-06 (1.247528)	0.063646 (2.969439)*		0.913166 (27.25404)*
AR(1)-EGARCH	-8.445711 (-2.332696)*	0.101023 (1.029751)	-0.188477 (-2.656954)*	0.060894 (0.149413)
AR(1)-TGARCH(1,1)	3.37e-06 (1.228160)	0.059143 (2.160065)*	0.013465 (0.381446)	0.909987 (26.22413)*
C. FTSE/ASE Mid 40 index				
MODELS	**ω**	**α**	**γ**	**b**
AR(1)-GARCH(1,1)	4.12e-06 (1.440297)	0.080306 (3.062737)*		0.890123 (23.76665)*
AR(1)-EGARCH	-0.569871 (-2.094279)*	0.165239 (2.920557)*	-0.042069 (-1.062625)	0.950476 (32.81851)*
AR(1)-TGARCH(1,1)	4.73e-06 (1.557205)	0.065814 (2.377132)*	0.041236 (0.770116)	0.880658 (24.03646)*
D. FTSE Small Cap 80 index				
MODELS	**ω**	**α**	**γ**	**b**
AR(1)-GARCH(1,1)	2.21e-06 (1.527369)	0.071586 (2.822219)*		0.919422 (37.34122)*
AR(1)-EGARCH	-0.263900 (-2.861225)*	0.168122 (3.265279)*	-0.041964 (-1.118386)	0.984054 (111.1076)*
AR(1)-TGARCH(1,1)	2.81e-06 (1.804452)	0.057248 (2.847599)*	0.055765 (1.025727)	0.906416 (36.23539)*

Notes: We report the results from the conditional variance equation only.
* Significant at the 5% level.

Table 5

Estimation Results of GARCH Models (Post-IAS Period)

A. General ASE index				
MODELS	**ω**	**α**	**γ**	**b**
AR(1)-GARCH(1,1)	3.52e-05 (0.614123)	0.096255 (1.140103)		0.374598 (0.416165)
AR(1)-EGARCH	-2.585359 (-1.198330)	0.001105 (0.009808)	-0.123738 (-1.339273)	0.731697 (3.259318)
AR(1)-TGARCH(1,1)	3.41e-05 (1.060782)	0.012840 (0.125434)	0.163236 (1.154812)	0.388282 (0.755779)
B. FTSE/ASE-20 index				
MODELS	**ω**	**α**	**γ**	**b**
AR(1)-GARCH(1,1)	4.15e-05 (0.682201)	0.087030 (0.985028)		0.407798 (0.526929)
AR(1)-EGARCH	-0.347369 (-0.853354)	0.091900 (1.149954)	-0.002526 (-0.059486)	0.970827 (24.77413)*
AR(1)-TGARCH(1,1)	3.83e-05 (0.924695)	0.018573 (0.219347)	0.114224 (0.841255)	0.455580 (0.855388)
C. FTSE/ASE Mid 40 index				
MODELS	**ω**	**α**	**γ**	**b**
AR(1)-GARCH(1,1)	6.80e-06 (1.356584)	0.108533 (1.902757)*		0.799533 (7.490022)*
AR(1)-EGARCH	-5.661617 (-2.081527)*	0.035870 (0.303498)	-0.346554 (-4.252030)*	0.414375 (1.496770)
AR(1)-TGARCH(1,1)	3.49e-05 (56.45414)*	-0.106542 (-1.809446)	0.455867 (3.586867)*	0.403515 (4.680164)*
D. FTSE Small Cap 80 index				
MODELS	**ω**	**α**	**γ**	**b**
AR(1)-GARCH(1,1)	1.76e-05 (1.245982)	0.112086 (1.510074)		0.640039 (2.671119)*
AR(1)-EGARCH	-2.973785 (-1.101388)	0.175379 (1.452433)	-0.049454 (-0.466766)	0.704021 (2.535490)*
AR(1)-TGARCH(1,1)	1.17e-05 (1.278844)	0.036352 (0.577833)	0.073589 (0.586971)	0.759521 (4.730625)*

Notes: We report the results from the conditional variance equation only.
* Significant at the 5% level.

- The Unconditional Variance

In most of the AR (1)-GARCH (1,1) models the ARCH and GARCH parameters are non-negative. Also since the sum of a and b for the GARCH (1,1) model is less than one, then the models have finite unconditional variances. The unconditional variance (h) has the form:

$$h = \frac{\omega}{1 - a - b} \tag{4}$$

Comparing the parameters across the two sub-periods, we find that, for all indices, there has been a decrease in both the ARCH and GARCH parameters. Now, in the case of the AR (1)-GARCH (1,1) model the unconditional variance for the General ASE index is equal to 1.094e-05 for the pre-IAS period and to 6.652e-06 for the post-IAS period. In addition, for FTSE/ASE-20,

the unconditional variance is equal to 1.384e-05 for the pre-IAS period and to 8.215e-06 for the post-IAS period. In other words, the unconditional variance in the post-IAS period is lower than that of the pre-IAS period. This indicates lower market volatility after the introduction of IAS in Greece.

For the FTSE/ASE Mid 40 index, the unconditional variance is still lower in the post-IAS period. More specific, for the AR (1)-GARCH (1,1) the unconditional variance is equal to 1.393e-05 for the pre-IAS period and to 7.396e-06 for the post-IAS period. Also, for FTSE/ASE Small Cap 80 the unconditional variance changes from 2.457e-05 to 7.1e-06. Thus, the unconditional variance in the post-IAS period is lower than that of the pre-IAS period. In other words, the volatility of the Greek stock market diminished after the introduction of IAS.

V. Summary and Conclusion

From 1/1/2005, the financial statements of limited companies in Greece must be prepared in accordance with International Accounting Standards (IAS). The introduction of IAS and, in particular, the impact of IAS on stock market volatility are a new research topic. To our knowledge, this is the first paper that examines the adoption of IAS related to the Greek stock market.

A significant indicator of this effect is stock market volatility. Volatility is one of the most important concepts in finance. It can be measured as standard deviation or variance of series, and is often used as a crude measure of the total risk of financial assets.

We analyse the relationship between IAS and stock market volatility for the Athens Stock Exchange using several GARCH models for modelling four indices: the General ASE index, FTSE/ASE-20, FTSE/ASE Mid 40 and FTSE Small Cap 80 indices. The AR (1)-GARCH (1,1) and its extensions, AR (1)-EGARCH (1,1) and AR (1)-TGARCH (1,1) have been found to be the most parsimonious representations of conditional variances for all indices considered.

The results for the effect of IAS on the Greek stock market suggest that there has been a negative – but not significant – effect on stock price volatility. During the sub periods, we find that good news has a lesser impact on stock return volatility, and also, that the persistence of shocks is reduced indicating the increased market (pricing) efficiency. This is not surprising since the Greek stock market is a highly liquid market. In addition, the results suggest that old news has either a greater or lesser persistent effect on price changes.

In conclusion, the evidence suggests that there is no effect of IAS on Greek stock market volatility. This is confirmed by the estimation of three different types of GARCH specifications and unconditional variances. Particularly, the unconditional variance in post-IAS period found to be lower than that of the pre-IAS period (for all indices). This indicates lower market volatility after the adoption of IAS in Greece. These findings are helpful to financial managers dealing with Greek stock indices. Finally, for future research in this area, we should test whether the introduction of IAS affects accounting values using data from European companies listed on several stock exchanges.

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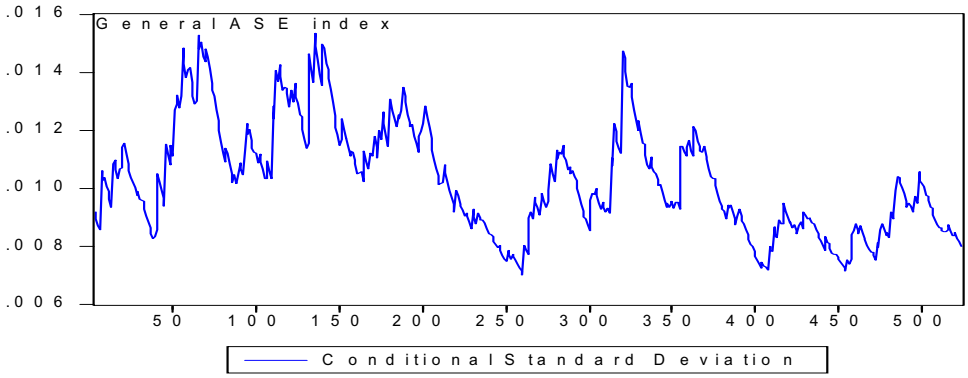
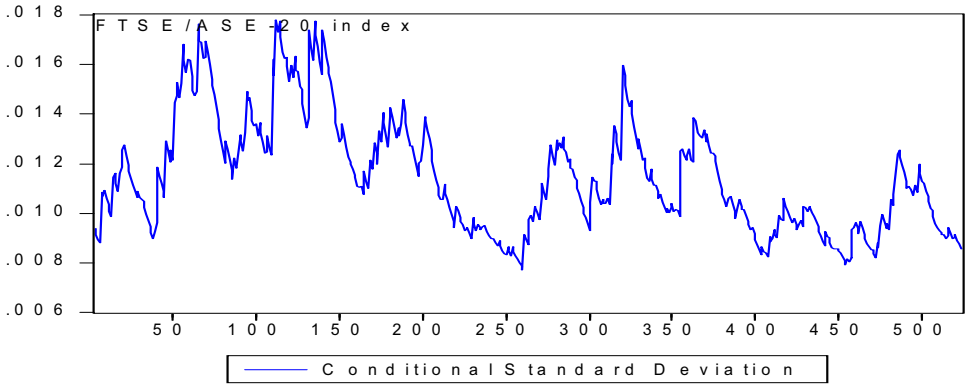
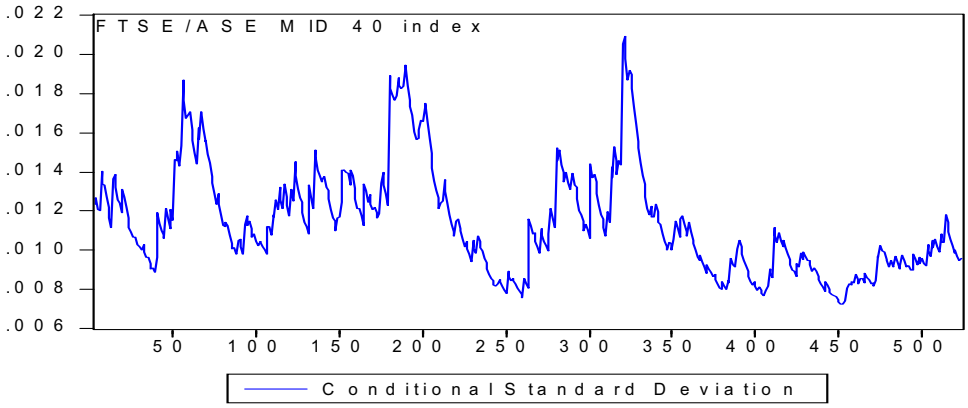
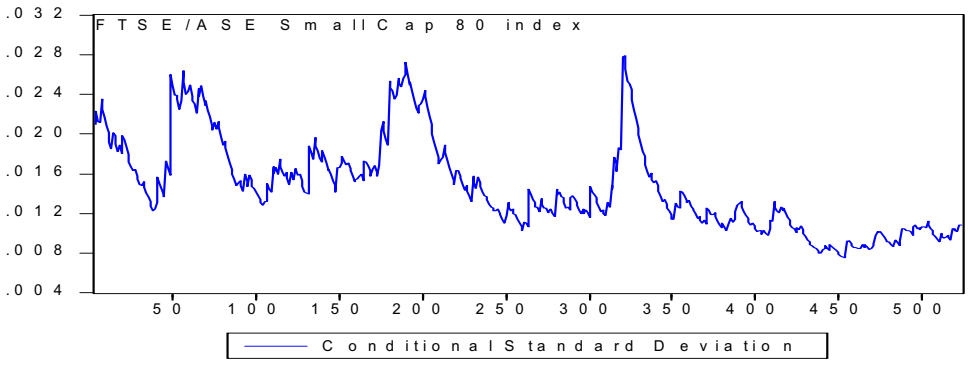
APPENDIX 1: Plots of Conditional Variance Series Before the Introduction of IAS









APPENDIX 2: Plots of Conditional Variance Series After the Introduction of IAS