

# WHAT INTERNATIONAL ACCOUNTING STANDARDS (IAS) BRING ABOUT TO THE FINANCIAL STATEMENTS OF GREEK LISTED COMPANIES? THE CASE OF THE ATHENS STOCK EXCHANGE

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## Abstract

The aim of the present study is to investigate the repercussions of the accounting changeover from the Greek Accounting Standards (GAS), to the International Accounting Standards (IAS) in relation to the published financial statements of Greek listed companies for the year 2004. The results show that tangible assets, fixed assets, and total liabilities record significantly higher prices under the IAS. Furthermore, it was recorded that, in opposition to the net income after taxes, the book value appears to play a more significant role under the IAS, compared to that under the GAS. There is also evidence that the adjustments of GAS to net income improve incremental value relevance, while the adjustments of GAS to book value do not improve it. JEL Classification: M41 - Accounting

**Keywords:** International Accounting Standards (IAS), Greek Accounting Standards (GAS), Value relevance, Incremental value relevance, Accounting Standards, Fair value.

## 1. Introduction

Within the context of developments taking place in the world economy in recent years and due to the occurrence of series corporate scandals (e.g. Enron, Parmalat), the European Union decided, on the 31<sup>st</sup> of December 2001, that all listed companies in organized European capital markets must prepare their consolidated balance sheets in accordance with the International Accounting Standards. At the same time, the European Union allowed their voluntary application of the remaining non-listed companies and permitted the member-countries to extend their application. Thus, from the 1<sup>st</sup> of January, 2005, the overwhelming majority of E.U. member-countries, including Greece, have confronted the application of two accounting systems, one for listed and the other

for non-listed companies. For the handling of the matter, Greece currently considers the progressive establishment of the compulsory application of the IAS to non-listed companies.

The aim of the present analysis is to track the effects of the accounting standards changeover from the previously applied Greek Accounting Standards to the International ones, in the published financial statements of Greek companies. Thus in Greece, where the French-German model (stakeholder oriented accounting system) was applied, important effects from the application of new accounting standards are expected. This is because the IAS, influenced by the shareholder oriented accounting system, target on the improvement of investor protection.

In the case of Greek companies, we collected data from their published financial statements for the years 2004 and 2005 (which we took from the Athens Stock Exchange and the Greek Capital Market Commission), regarding both accounting systems (GAS and IAS). In order to track the consequences involving the application of the IAS to the financial statements of Greek companies, our analysis focused on two points. Initially, we investigated the influence of certain accounting magnitudes and financial indicators through the use of descriptive statistics. We also investigated the value relevance (both relative and incremental), of the book value and net income in relation to the IAS and the GAS.

The results of the descriptive statistical analysis appear to support the argument that the GAS are more conservative, while the IAS are characterized by the principle of “fair value”. More specifically, it was found that the tangible assets, the fixed assets, and the total liabilities under the IAS recorded significantly higher values in comparison with the GAS. Simultaneously, the examination of standard deviation shows that the introduction of the IAS appears to increase the variability of the majority of balance sheet measures (i.e. fixed assets, total assets, total liabilities, and book value). Finally, the new standards also appear to influence certain popular indicators of financial analysis, such as Asset Turnover (ATO) and Leverage (LEV).

For the purpose of investigating the influence of the IAS in the correlations of book value and net income with the share prices (i.e. value relevance), we examined both the relative and incremental value relevance. However, in order to obtain more accurate results and therefore make safer conclusions, we correct multicollinearity by applying the innovative methodology of Ridge regression in the examination of value relevance. In coding the results, it appears that

the IAS, in opposition to the GAS, give particular weight to the balance sheet and to fair values. More importantly, the results of relative value relevance did not record, in the case of the IAS, improvement of relative value relevance regarding the book value and net income (separate or in combination). However, in a model that included the book value along with net income it was found that the book value, in contrast to net income, is more significant under the principles and the rules of IAS. Finally, the results in incremental value relevance recorded that the adjustments of the GAS to net income (net income of GAS minus net income of IAS), significantly improve the value relevance, whereas the adjustments of the GAS to book value (book value of GAS minus book value of IAS), surely do not improve it.

The present study touches upon a line of questions that have continuously occupied the international bibliography. In particular, this study examines how stakeholder oriented countries are influenced by the new accounting standards and compares indirectly the accounting systems of stakeholder and shareholder oriented countries.

The remainder of this study is organized as follows: Part Two provides a detailed description of the bibliography with regard to the IAS. The data and the sample companies that were used are presented in Part Three. Part Four analyzes the methodology that was applied. The results of the study are shown in Part Five. Finally, the conclusions and any possible further analyses are recorded in Part Six and Seven respectively.

## **2. Literature review**

The importance of the question regarding the adoption and application of IAS is undoubtedly enormous, as is the spectrum of subjects to which it is related. Consequently, the IAS has been the subject of numerous studies in world markets.

Even though the application of IAS was rendered compulsory from 2005, many companies all over the world found it worthwhile to willingly begin their application earlier. On account of this event, plenty of studies took place in order to find out what the characteristics of these companies are and consequently, to discover the possible advantages in applying IAS. In the studies of AL-Basteki (1995), Murphy (1999), Tarca (2002), and El-Gazzar, Finn and Jacob (1999), it was made evident that companies which voluntarily apply the IAS have as a common denominator the listing in many foreign stock markets and the internationalization of their sales.

Concurrently, a large volume of studies {Garrido, Leon and Zorio (2002), Fontes, Rodrigues and Craig (2005), Street, Gray and Brayant (1999), Murphy (2000), Rahman, Perera and Ganesi (2002), Street and Gray (2002), and Larson and Street (2004)}, investigated the harmonization of national (i.e. domestic) accounting standards with the international accounting standards. According to the international bibliography, the notion of harmonization has two meanings. In particular, the **formal harmonization** related to harmonization at the level of laws and regulations, is separate from the **material harmonization**, which is related to a harmonization at the procedural level applied by the companies. Some of the studies related to the formal harmonization include that of Garrido, Leon and Zorio (2002), and Fontes, Rodrigues and Craig (2005). Studies that report on the subject of material harmonization include that of Street, Gray and Brayant (1999), Murphy (2000), Rahman, Perera and Ganesi (2002), Street and Gray (2002), and Larson and Street (2004).

Another sector which appears to be related to the IAS is the subject of creative accounting or earnings management and how much this is limited depending on the accounting standards that are applied. In analytical terms, Zimmermann and Gontcharov (2003), showed that the German companies resort to the equal manipulation of their profits, with both the German standards and the International Accounting Standards. Conversely, the German companies that apply the American accounting standards (US GAAP), present more precise, hence of higher quality profits. In contrast with the analysis of Zimmermann and Gontcharov (2003), the analysis of Barth, Landsman and Lang (2005), which supported the examination of sample companies coming from various countries, led to the conclusion that the companies manipulate their profits less when the IAS are applied.

One of the more common questions within the international bibliography, if not the most popular, that has occupied financial accounting is the investigation of the correlations of accounting information (i.e. Earnings, book value, cash flows, etc.), with share prices and returns (value relevance). A catapult for further studies was made possible by the research of Ball and Brown (1968), via the investigation of the correlation of earnings with share returns which led to the conclusion that share prices react positively to the accounting information that is included in published financial statements. The main goal of a number of studies that came to fruition in the last few years was to examine whether the correlation between the accounting information and share prices differentiates depending on the accounting standards applied. The need for the conduct of such studies became even stronger from the moment that the IAS were presented. This generated a rich bibliography that focused on this question.

Numerous studies (Sami and Zhou - 2004, Lin and Chen - 2005, etc.), have become present in order to compare the International Accounting Standards with the Chinese Accounting Standards (CAS). The existence of a large number of such studies is related to the fact that in China, two organized money and capital markets function, where one is concerned exclusively with domestic investors and the other with foreign investors. Any companies that issue shares in the domestic market must prepare their financial statements under the Chinese Accounting Standards (CAS), while those companies that issue shares in the second market must prepare their financial statements under the rules and principles of the International Standards. Furthermore, any companies that issue shares in both markets must prepare their published financial statements under CAS as well as IAS. This characteristic has made the Chinese Stock Exchange market the center of the study in question, as this market provides a unique comparative advantage with the purpose of comparing directly the IAS to domestic accounting standards (CAS), over longer periods of time and not only, as has been the case with plenty of countries in the European Union, in the changeover year from one system to the other (i.e. 2005). A study such as this one was realized by Sami and Zhou (2004), in a sample of eighty-one companies, which issued shares in both markets for the period of 1994 to 2000. The results showed that the accounting information is related to the share prices under both accounting systems; however the cross-correlation in question is larger under the IAS. Another study regarding the Chinese Stock Exchange market is that of Lin and Chen (2005), where using a different methodology from Sami and Zhou (2004), led to the opposite conclusion; namely, that the accounting information governed by the principles of the CAS has larger cross-correlation with the share prices and share returns in comparison to that of the IAS.

However, the international bibliography did not only focus on the Chinese market but on the German market as well, comparing the German Accounting Standards (German AS), to the international standards. The study of Hung and Subramanyam (2004), in a sample of eighty companies that voluntarily applied the IAS, exclusively compared the IAS with the German Accounting Standards in the year of accounting changeover from the German Accounting Standards to the IAS. The results of the above analysis showed amongst other things that the book value of equity under the IAS in relation to the German accounting standards and in opposition to the net income is related more to share prices.

Furthermore, studies such as that of Harris and Muller (1999), have dealt with the comparison of the IAS to the American Accounting Standards (US GAAP). According to the Securities and Exchange Commission of the United

States of America (SEC), all foreign companies that hope to be listed in American stock markets must reconcile their accounting - financial statements in accordance with the principles and rules that govern the American Accounting Standards (US GAAP). This reconciliation however has raised serious objections, as in the majority of cases it functions as a constraint for many companies trying to be listed in American stock markets, for it can cause serious financial losses to these companies. Since the IAS is similar, however with certain differences, to the US GAAP in comparison to any other accounting standards, these objections became even greater in the light of new accounting standards. In these frameworks, all of the former events function as a motivating factor in the context of Harris and Muller (1999), in order to compare the IAS with the US GAAP. Specifically in their study they used a sample of thirty-one non-American companies that had their primary financial statements under the IAS, and they reconcile them under the US GAAP in order to participate in American stock markets. For their methodology, Harris and Muller (1999), used price models, return models, and market value models. Regardless of the fact that the results were not homogeneous for the three examined models, the general finding of their analysis was that the accounting magnitudes (i.e. net income) reconciled to the American Accounting Standards (US GAAP), have greater value relevance in comparison to that of the IAS.

Finally, Barth, et al., (2005), expanded the above analysis by comparing IAS to domestic accounting standards for more than one country. They specifically examined how much the IAS improved the quality of accounting information amongst a large sample of companies from twenty-three different countries (for the 1994 to 2003 period). The results showed that the examined accounting magnitudes (book value and net income), under the IAS, have greater correlations with the share prices and returns. These results however require particular attention as, in contrast to other studies, they are not focused exclusively on one country. Therefore, we can draw relatively more valid conclusions about the general effect of IAS rather than the country effect per se. Moreover, the main disadvantage of studies that involve companies from various countries is that it is difficult to check the specific characteristics of each country separately and henceforth comparability of data is not secured.

### **3. Sample and data**

The sample used in the present study is composed of companies in which shares are listed in the Athens Stock Exchange and where the period concerned involves the administrative years of 2004 and 2005. There were over one hun-

dred companies included in the initial sample and with all sample companies, the administrative year finished on the 31st of December of the year in question. Among the sample companies, there was no company with over a twelve-month period of use. From the final sample however, financial, insurance and investment companies were excluded in compliance to previous studies within the international bibliography. The reason for omitting these companies is related to the fact that they follow different accounting practices and rules in their published financial statements. Also, as in the analysis of Hung and Subramanyam (2004), companies that presented negative book value under both accounting standards were included in our sample. Finally, certain companies that did not have the necessary data were not included in the present study. Taking into consideration all of the above criteria, a total of eighty-three companies were included for the examination of the value relevance.

All the data was extracted from the Capital Market Commission and the Athens Stock Exchange.

For the final sample of companies that were examined, we obtained accounting information from the financial statements that had been prepared up until the presently applied accounting standards in Greece, as well as the international standards for the year that preceded the compulsory accounting changeover to the IAS, i.e. 2004. It is a remarkable fact that in the present study, in opposition to the study of Hung and Subramanyam (2004), and with other corresponding studies as well, an overwhelming majority of the companies that composed the sample were compelled to adopt and apply the IAS from the current legislation and did not proceed in voluntary adoption.

Table of 1 reports the names of the eighty-three companies that were used for the present analysis. Table 2 records the distribution of sample companies that were used in the regressions under each sector. Table 2 also states that the examined companies are uniformly distributed amongst the sectors. Specifically, it can be observed that no sector exceeds 16 per cent in participation, while a large concentration of companies appear in the sectors of construction & materials, basic resources, food & beverage, industry goods & services, and personal & household goods.

#### **4. Methodology**

As reported previously, the aim of the present study is to investigate the repercussions of applying the IAS to the financial statements of Greek companies. For this reason, the influence of the IAS is examined regarding relevant

accounting magnitudes and financial indicators as well as how the IAS differentiates value relevance in the two examined accounting systems. In order to obtain answers to the above questions, the methodology applied was based mainly on the corresponding method that was used in the analysis of Hung and Subramanyam (2004). With this methodology it is possible to draw upon the data of a sample companies for a particular year based on the two systems and consequently, to compare directly accounting magnitudes under the IAS and the GAS. Specifically, we first took the published financial statements of Greek companies for the year 2004, the final year in which the GAS were applied. For the purpose of collecting accounting data for 2004 based on the IAS, we reviewed the financial statements of companies for 2005. In 2005, the first year of compulsory application of the IAS in Greece, companies were compelled to publish, for comparison reasons, the published statements of 2005 along with the accounting magnitudes of corresponding years and those of 2004 under the IAS. In this way, and in following the pioneering methodology Hung and Subramanyam (2004), we collected data based on the two accounting standards for the same year and for the same companies, a fact that allows us to check any possible differences in the two systems via cross – sectional analysis.

In identifying how the examined accounting changeover influences the accounting magnitudes of balance sheet and profit & loss account, the descriptive statistics (i.e. mean, median, and standard deviation), of these magnitudes were examined, along with the IAS and GAS, and was recorded whether the differences between the two accounting systems were statistically significant or not. Specifically, the differences in mean were based on pair wise t – tests, in median on signed rank tests, and in standard deviation under the control of distribution with F statistic.

At the same time, with the purpose of investigating the cross-correlation of accounting magnitudes with the share prices (value relevance), the accounting magnitudes of book value and net income were used. Moreover, it should be noted that, as with numerous corresponding studies, the share prices represent the fundamental value of the company.

As reported in the above literature review, numerous studies have investigated the question of value relevance. However, two kinds of models have been used. One uses share prices as dependent variable (price models), and the other share returns (return models). These two approaches are connected to the problem that exists in the international bibliography regarding the question of which of the two models should be used in such kind of studies. Moreover, the price models present a series of comparative advantages versus the return



models, in that they render possible the examination of two accounting items of information in one model simultaneously (e.g. as with book value and net income). This advantage is important, as it is likely to record trade offs between the value relevance of book value and net income (Hung and Subramanyam, 2004). In contrast with the above advantages, the price models record disadvantages of econometric nature such as heteroskethasticity and scale problems, which in the return models are either erased or are at least limited. Due to the existence of these problems in both the price models we examined, the numbers of shares were used as a deflator.

The first of the two models used in our analysis examined how much the accounting magnitudes of book value and net income render information that is included in the share prices for each one of the examined accounting systems separately (Relative value relevance). The theoretical background of this model is found within the company valuation theory. According to the analysis of Ohlson (1995), the share price, which is considered as the value of the company, can be expressed in the form of a linear model where the independent variables represent the book value and net income. Therefore, in the present study, the book value and net income are treated as independent variables. Consequently the first model examined is the following

$$P_{it} = a + b BV_{it} + c NI_{it} + e_{it} \quad (1)$$

where

**P<sub>it</sub>**: the share price for the company *i* at the end of year *t* (2004),

**BV<sub>it</sub>**: the book value of equity per share for the company *i* at the end of year *t*

**NI<sub>it</sub>**: the net income after taxes per share for company *i* at the end of year *t*.

It should be noted that the prices of both the book value and net income are produced after the subtraction of minority interests.

As in the study of Hung and Subramanyam (2004), model (1) was examined in three different ways: a) treating the book value as a unique independent variable, b) treating the net income as a unique independent variable, and c) with these two accounting magnitudes treated simultaneously in the same model as independent variables. Thus we applied the model of linear regression, taking into consideration all of the above cases. The aim of the above regressions can be found in the cross-correlations. All of the above regressions were calculated using data under IAS and GAS. In addition, the differences in coefficients and Adjusted R-Squares were recorded. Specifically, the tests in coefficients are

based on t-tests and the tests in Adjusted R-Squares are based on Young tests (Young, 1989).

In contrast to the first model, where we examined accounting magnitudes for each accounting system separately (Relative Value Relevance), in the second model we investigate how much the accounting magnitudes under the GAS provide more information than those of the IAS (Incremental Value Relevance). Specifically, the second model examined is the following

$$P_{it} = a + b BV\_IAS_{it} + c BV\_DIF_{it} + d NI\_IAS_{it} + e NI\_DIF_{it} + e_{it} \quad (2)$$

where

**P<sub>it</sub>**: the share price for the company *i* at the end of year *t* (2004)

**BV\_IAS<sub>it</sub>**: the book value of equity per share for company *i* at the end of year *t* under the IAS

**BV\_DIF<sub>it</sub>**: the book value of equity per share under the GAS - book value of equity per share under the IAS

**NI\_IAS<sub>it</sub>**: the net income after taxes per share for company *i* at the end of year *t* under the IAS

**NI\_DIF<sub>it</sub>**: the net income per share under the GAS - net income per share under the IAS

For both of the above equations (Relative and incremental value relevance) in order to avoid inaccurate results due to multicollinearity, we applied the methodology of Ridge regression. However, at this point we have to mention that it is the first time the methodology of Ridge Regression is applied in this kind of studies. Therefore, the results of the relative and incremental value relevance and generally the conclusions of our study obtain greater importance due to the application of the innovative methodology of Ridge Regression. Finally, for the analysis of data, the statistical packages SPSS, EViews, and Mini tab were used.

## 5. Results

### 5.1 The consequences of the new accounting system with regard to accounting magnitudes and indicators of the financial statements

Table 3 presents the descriptive statistics (i.e. Mean, Median, and Standard Deviation), of economic and accounting variables from the balance sheet and the profit & loss account, for both accounting standards and the statistical sig-

nificance of their difference. Specifically, we observe that the parametric and non-parametric tests detected significant difference with regard to the means and the medians in the Tangible Assets (TN.A), Total Fixed Assets (TFA), Inventories, Total Liabilities (TL), and Asset Turnover (ATO) variables. There are also uniform results in the means and medians for the variables Book Value (BV), Sales, Net Income before Taxes (NIBT), Net Income (NI), Return on Assets (ROA), Return on Equity (ROE), and Profit Margin (PM), while refuted findings resulted in the variables of Total Current Assets (TCA), Total Assets (TA), and Leverage (LEV). We also observed a differentiation in the changeability for the most of the above variables as shown by the levels of statistical significance regarding the standard deviation (e.g. TFA, TA, BV, NIBT, ROA, ROE, and LEV).

The above results also show that the introduction of the IAS either identifies more assets and liabilities or measures them at higher prices. The results of the balance sheet analysis appear to speak in favor of the idea that the GAS are more conservative in relation with the IAS.

In summarizing the above findings, the adoption and application of the IAS considerably influence a great deal of accounting magnitudes and financial indicators. The results showed that the categories of tangible assets, fixed assets and total liabilities impart considerably higher prices under new accounting standards (IAS). It was still evident that the IAS increase the differences between companies in the majority of balance sheet magnitudes. The above results appear to be compatible with the principle of “fair value” introduced by the IAS and the conservatism of the GAS. Simultaneously, the recent accounting changeover shows that it significantly affects in certain popular financial indicators that are used to make important decisions.

## **5.2 The consequences of the new accounting system regarding the value relevance of accounting magnitudes**

### *Relative Value Relevance*

The Pearson correlation coefficients for the variables in model (1) are presented in Table 4. As a first investigation of the correlations between the share prices and the independent variables, the Pearson correlation coefficients show that the book value and net income relate positively to the share prices with both accounting standards. However, it is observed the book value has higher correlation with the share prices under the IAS, in contrast to the net income, which record higher correlation under the GAS. In order to investigate the

magnitude of multicollinearity, we examined the Pearson correlation coefficients for the independent variables of model (1). The results showed that the correlations in question are not very large. Specifically, the correlation between the book value and net income is 55% for the GAS and 62% for the IAS. In the past, many corresponding studies ignored the problem of multicollinearity. For example, in the analysis Sami and Zhou (2004), the Pearson correlation coefficients between the independent variables “book value” and “net income” recorded correlations greater than 70%. However, no effort was made to limit the phenomenon by omitting some variables (or modifying the model), because both independent variables were vital for their analysis. Moreover, in accordance with the analysis of Hung and Subramanyam (2004), it does not require further clarification and analysis. Although multicollinearity does not seem to be an important problem in our model (in comparison with other similar studies), in order to check the extent that multicollinearity influences our results we applied the methodology of Ridge Regression. Therefore, we extend the studies which ignore the effect of multicollinearity by applying this innovative methodology. However, in contrast to the majority of the studies we did not limit the phenomenon by omitting a variable from the model, as both independent variables were vital for our research. Specifically, through the innovative methodology of Ridge Regression we managed to correct the effect of multicollinearity by using both independent variables (“book value” and “net income”), in the same model simultaneously.

Table 5 presents the results of the relative value relevance after the application of Ridge Regression. The results for each examined model include the coefficients of independent variables with the corresponding levels of statistical significance and the adapted coefficients of determination (Adjusted  $R^2$  indicators). The Adjusted  $R^2$  indicator is used in order to reveal the explanatory power of each model and in such a way find the correlations between the share prices and the examined accounting information. Beginning our analysis with the indicator in question, it is observed that, in the model where the book value is treated as a unique independent variable, the explanatory power of the IAS is greater than that of the GAS (32.6% as opposed to 22.9%). However, the difference between the two systems (-9.7%) is not statistically significant at the conventional levels. Conversely, in the model where the net income is treated as a unique independent variable, the situation is reversed and the GAS presents a greater explanatory power than that of the IAS (69% as opposed to 54.2%), but also not statistically significant. Finally, in the combined models, it is observed that the GAS have a greater explanatory power with regard to both the book value and net income (66.3% versus 54.6% of the IAS). However, the differ-

ence between the two systems (11.7%) is not statistically significant. Therefore, from the examination of the Adjusted  $R^2$  indicators it seems that the value relevance of accounting information (in combination or separate), does not record improvement after the introduction of IAS.

Following the examination of the Adjusted  $R^2$  indicator, we will deal with the coefficients of each model. Starting again from the model where the book value is treated as a unique independent variable, we observe that the coefficients of the book value are statistically significant at the 1% level. In accordance with the observed levels of statistical significance of the coefficients' difference, we observe that the coefficients do not differ based on the IAS or the GAS. In contrast, in the model where the net income is treated as a unique independent variable, the results are slightly different. Specifically, it is recorded that although the net income coefficients are significant with regard to both accounting systems at less than 1% level, that of GAS appear to be greater than the equivalent of the IAS (9.58 as opposed to 7.93). By examining the difference between these two coefficients, it was found that it is statistically significant at the 6% level. The higher prices of coefficients regarding net income under the GAS are in favor of the argument that earnings, up until the presently applied accountant standards in Greece, are smoother and therefore more stable than those of the IAS (Hung and Subramanyam, 2004). In finishing the analysis of relative value relevance, we examine a model that also includes both accounting magnitudes as independent variables, so that we might have a more explicit picture. The recorded results are rather interesting. Beginning with the book value coefficients, we observe that under the GAS the coefficient is not statistically significant at the conventional levels. Conversely, when the book value is in harmony with the principles and rules of the IAS, the situation changes and the book value coefficient presents a statistical significance at a lower than the 1% level. Equally interesting as well is the presence of the net income coefficients. Specifically, it is observed that the net income coefficients are statistically significant at a lower than 1% level with both the IAS and the GAS. In addition, although it is recorded a greater coefficient under GAS (8.53 as opposed to 6.09 under IAS), the difference between the two coefficients is not statistically significant at the conventional levels.

#### *Incremental Value Relevance*

The Pearson correlation coefficients regarding the variables in model (2) are presented in Table 6. As an initial investigation of the correlation of price with independent variables, the Pearson correlation coefficients show that all the independent variables are significantly correlated (at the 1% level of statistical significance), with the share prices, apart from the difference of net income.

In order to investigate the magnitude of multicollinearity, we examined the Pearson correlation coefficients for the independent variables in model (2). The results showed that the correlations in question are not very large, with the higher prices recorded under the system of the IAS in the correlations of book value with the earnings and the difference of earnings (62% and 53% respectively), but they continue to remain at low levels. However, as in the Relative value relevance, in order to check the effect of multicollinearity in our model, we applied the methodology of Ridge regression in the incremental value relevance.

Table 7 presents the results of the incremental value relevance after the application of Ridge Regression. The results show that the coefficient of earnings per share under the IAS is both positive and statistically significant at a lower than 1% level. At the same time however, it is recorded that the adjustment of GAS to net income is both positive and statistically significant at the 1% level as well, in fact implying that the GAS improve incremental value relevance of earnings. On the contrary, the coefficient of book value per share under the principles of the IAS is also positive and statistically significant at a lower than the 6% level. Simultaneously, the adjustment coefficient of GAS to book value is negative and not statistically significant, a result which indicates that the GAS do not improve the incremental value relevance of book value. However at this point, we have to notice that the report of Hung and Subramanyam (2004), which constitutes the basis for our study, did not examine the adjustments of accounting magnitudes under domestic accounting standards (German standards in that case), as our research suggests. Conversely, the study examined the IAS adjustments to accounting magnitudes. For this reason, and in order to make our conclusions more precise, we also investigated these adjustments which indirectly confirmed the results of Table 7.

## 6. Conclusions

The aim of the present study was to identify the consequences of accounting changeover from the GAS to the IAS within the published financial statements of Greek companies. The results of this analysis require particular attention, since up until the presently applied accounting system in Greece, the Greek accounting standards had a different foundation and orientation (stakeholder oriented system), in comparison with the IAS (shareholder oriented system).

Comparing the IAS to the GAS in a sample of companies and exclusively for the year 2004, the results of the present research can be classified as follows: the accounting magnitudes of tangible assets, fixed assets, and total liabilities record considerably higher prices in the balance sheets of companies after the

accounting changeover. Moreover, the IAS increase the differences between the companies in the majority of balance-sheet measures. At the same time, examining the relative value relevance of the accounting information, it was found that the book values of equity, in contrast to net profits, play a more important role under the IAS in comparison with that of GAS. However, from the examination of the Adjusted  $R^2$  in the relative value relevance, no improvement was recorded in the relative value relevance of either accounting information (book value and/or net income), after the introduction of IAS. Finally, in examining the incremental value relevance, it was recorded that the GAS adjustments to book value (book value GAS – book value IAS), are not statistically significant, while those of GAS to net income (net income GAS – net income IAS), are statistically significant. The validity of the value relevance (relative and incremental) results is increased as the effect of multicollinearity is corrected through the application of the innovative methodology of Ridge Regression. In summary, the findings of this study seem to be consistent with the notion that GAS are more conservative, while IAS are characterized by the principle of “fair value” and lay emphasis on the balance sheet.

Since in Greece the local accounting standards give emphasis to the protection of investors and taxation (stakeholder oriented accounting system), the results of the present study can be compared to the results of corresponding studies with similar methodology that examine the effects of the IAS in countries with similar accounting systems. For example, the analysis of Hung and Subramanyam (2004) for Germany recorded results similar to ours. Up until the obligatory application of the IAS, Germany and Greece had the same accounting system (stakeholder oriented accounting system). Therefore, the present study contributes to the international bibliography with regard to the consequences of applying the IAS in stakeholder oriented countries (i.e. Germany, France, Greece, etc.), and to the indirect comparison between the accounting systems of stakeholder and shareholder oriented countries.

However, some limitations have to be taken into consideration. In all of the above regressions we used only the numbers of shares as a deflator in order to reduce the econometric disadvantages of Price models. No other deflator was used to confirm the results. Finally, the sample of companies is smaller than that of other market – based analyses.

## **7. Further research**

Considering the given limitations that were reported above, a primary addition to the present study would be to use a greater sample. The enlargement of

the sample would be crucial in order to discover whether some of the differences between the two accounting systems which are non statistically significant are due to the small sample of companies that were used. At the same time, for the purpose of carrying out accurate conclusions in the investigation of value relevance, it would be particularly useful to examine how the results are differentiated by the usage of another deflator apart from the number of shares (e.g. lagged market – value).

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## Appendix

**TABLE 1**  
Sample companies

1. BLUE STAR FERRIES	30. ANEK A.E.	59. ΚΥΡΙΑΚΟΥΛΗΣ Α.Ε.
2. BYTE COMPUTER A.B.E.E.	31. ΑΤΛΑΝΤΙΚ ΣΟΥΠΕΡ ΜΑΡΚΕΤ	60. Μ.Ι.ΜΑΙΛΛΗΣ Α.Ε.
3. COCA-COLA A.E.	32. ΑΤΤΙΚΕΣ ΕΚΔΟΣΕΙΣ Α.Ε.	61. ΜΙΝΩΙΚΕΣ ΓΡΑΜΜΕΣ Α.Ν.Ε
4. CROWN HELLAS CAN A.E.	33. ΒΙΟΚΑΡΠΕΤ Α.Ε.	62. ΜΠΕΝΡΟΥΜΠΗ & ΥΙΟΣ Α.Ε.
5. CYCLON ΕΛΛΑΣ Α.Ε.	34. ΓΕΝΙΚΗ ΕΜΠΟΡΙΟΥ & ΒΙΟΜΗΧΑΝΙΑΣ Α.Ε.	63. ΜΠΗΤΡΟΣ ΣΥΜΜΕΤΟΧΙΚΗ
6. ELBISCO Α.Ε. ΣΥΜΜΕΤΟΧΩΝ	35. ΓΕΝΙΚΗ ΤΡΟΦΙΜΩΝ Α.Ε.	64. ΜΥΤΙΑΛΗΝΑΙΟΣ Α.Ε.
7. EURODRIP Α.Β.Ε.Γ.Ε.	36. ΓΕΡΜΑΝΟΣ Α.Β.Ε.Ε.	65. ΝΕΟΧΗΜΙΚΗ Α.Β.Ε.Ε.
8. F.G. EUROPE	37. ΔΕΛΤΑ PROJECT	66. ΝΗΡΕΥΣ Α.Ε.
9. FANCO Α.Ε.	38. ΔΗΜΟΣΙΟΓΡΑΦΙΚΟΣ ΟΡΓΑΝΙΣΜΟΣ ΛΑΜΠΡΑΚΗ Α.Ε.	67. ΝΙΚΑΣ Α.Β.Ε.Ε.
10. FASHION BOX ΕΛΛΑΣ Α.Ε.	39. ΔΙΕΚΑΤ Α.Τ.Ε.	68. ΠΕΡΣΕΥΣ Α.Β.Ε.Ε.
11. FLEXOPACK	40. ΕΚΔΟΣΕΙΣ ΛΥΜΠΕΡΗ Α.Ε.	69. ΠΕΤΡΟΠΟΥΛΟΣ Α.Ε.Β.Ε.
12. FOLLI-FOLLIE Α.Β.Ε.Ε.	41. ΕΛΒΑΛ Α.Ε.	70. ΠΗΓΑΣΟΣ ΕΚΔΟΤΙΚΗ Α.Ε.
13. FORTHNET Α.Ε.	42. ΕΛΓΕΚΑ Α.Ε.	71. ΠΛΑΣΤΙΚΑ ΚΡΗΤΗΣ Α.Β.Ε.Ε.
14. GOODY'S Α.Ε.	43. ΕΛΙΝΟΙΑ Α.Ε.	72. ΠΡΟΟΔΕΥΤΙΚΗ Α.Τ.Ε.
15. ΙΜΑΚΟ MEDIA S.A.	44. ΕΛΛΗΝΙΚΑ ΚΑΛΩΔΙΑ Α.Ε.	73. ΣΑΤΟ Α.Ε.
16. KLEEMANN HELLAS Α.Β.Ε.Ε.	45. ΕΛΛΑΤΕΞ Α.Ε.	74. ΣΕΛΜΑΝ Α.Ε.
17. LOGICDIS	46. ΕΛΛΗΝΙΚΗ ΤΕΧΝΟΔΟΜΙΚΗ	75. ΣΙΔΕΝΟΡ Α.Ε.
18. MEVACO Α.Ε.	47. ΕΛΛΗΝΙΚΗ ΥΦΑΝΤΟΥΡΓΙΑ Α.Ε.	76. ΣΩΛΗΝΟΥΡΓΕΙΑ ΚΟΡΙΝΘΟΥ Α.Ε.
19. MULTIRAMA Α.Ε.Β.Ε.	48. ΕΛΤΡΑΚ Α.Ε.	77. ΤΙΤΑΝ
20. NOTOS COM Α.Ε.Β.Ε.	49. ΕΜΠΟΡΙΚΟΣ ΔΕΣΜΟΣ Α.Ε.Β.Ε.	78. ΥΙΟΙ Χ.ΚΑΤΣΕΛΗ Α.Β.Ε.Ε.
21. RILKEN Α.Ε.	50. ΕΤΕΜ Α.Ε.	79. ΦΙΕΡΑΤΕΞ Α.Ε.
22. S&B ΒΙΟΜΗΧΑΝΙΚΑ ΟΡΥΚΤΑ Α.Ε.	51. Η ΚΑΘΗΜΕΡΙΝΗ Α.Ε.	80. Χ.ΡΟΚΑΣ Α.Β.Ε.Ε.
23. SPACE HELLAS Α.Ε.	52. ΙΝΤΡΑΚΟΜ	81. ΧΑΪΔΕΜΕΝΟΣ Α.Ε.
24. SPRIDER Α.Β.Ε.Ε.	53. ΙΚΤΙΝΟΣ ΕΛΛΑΣ Α.Ε.	82. ΧΑΛΚΟΡ Α.Ε.
25. UNIBRAIN Α.Ε.	54. Κ.Α.Ε. Α.Ε.	83. ΧΑΤΖΗΩΑΝΝΟΥ HOLDINGS Α.Ε.
26. Α.Β. ΒΑΣΙΛΟΠΟΥΛΟΣ	55. ΚΑΡΑΜΟΛΕΓΚΟΣ Α.Ε.	
27. Α.Γ.Ε.Τ. ΗΡΑΚΛΗΣ	56. ΚΑΡΑΤΖΗ Α.Ε.	
28. ΑΚΡΙΤΑΣ Α.Ε.	57. ΚΡΕΤΑ ΦΑΡΜ Α.Β.Ε.Ε	
29. ΑΛΟΥΜΥΛ ΜΥΛΩΝΑΣ Α.Ε.	58. ΚΡΙ - ΚΡΙ Α.Β.Ε.Ε.	

**TABLE 2**  
Distribution of sample firms by industry group

	N	%
Retail	7	8,43
Construction & Materials	10	12,05
Travel & Leisure	6	7,23
Basic Resources	9	10,84
Utilities	1	1,2
Food & Beverage	10	12,05
Industry Goods & Services	11	13,25
Chemicals	4	4,82
Personal & Household Goods	13	15,66
Media	6	7,23
Oil & Gas	1	1,2
Technology	5	6,02
<b>TOTAL</b>	<b>83</b>	<b>100</b>

**TABLE 3**  
Descriptive statistics on key accounting measures and financial ratios  
according to GAS and IAS

(N)	MEAN		MEDIAN		Std. Dev	
	GAS	IAS	GAS	IAS	GAS	IAS
<b>TANGIBLE ASSETS (93)</b>	101.604.740,6	124.230.215	30.216.560,00	42.426.000	241.524.477,2	263.353.445,3
	<i>p: 0,002***</i>		<i>p:0,000***</i>		<i>p: 0,21</i>	
<b>TFA (93)</b>	122.084.384	166.855.304	39.223.536	67.282.406	255.870.723,9	424.959.787,8
	<i>p: 0,024**</i>		<i>p:000***</i>		<i>p:0,01***</i>	
<b>INVENTORIES (92)</b>	33.520.966,40	31.170.727,81	15.388.915,66	14.176.415,4	53.298.774,72	52.096.547,11
	<i>p: 0,019**</i>		<i>p:000***</i>		<i>p:0,45</i>	
<b>TCA (92)</b>	108614934,8	105460284,1	63377200,33	62986973,14	144413153,6	150574302,5
	<i>p: 0,304</i>		<i>p:000***</i>		<i>p:0,4</i>	
<b>TA (93)</b>	234.474.613,40	270.932.648	120.268.000,5	114.560.000	390.732.843,1	556.698.009,7
	<i>p: 0,055*</i>		<i>p:0,001***</i>		<i>p:0,01***</i>	
<b>BV (92)</b>	81.181.289,19	106.435.500	44.125.628,40	49.405.087	98.756.536,05	233.939.875
	<i>p: 0,192</i>		<i>p:0,416</i>		<i>p:0,01***</i>	
<b>TL (93)</b>	139.265.031	157.730.909,5	62.744.973,00	73.059.000	274.454.821,5	317.371.557,5
	<i>p: 0,000***</i>		<i>p:000***</i>		<i>p:0,09*</i>	
<b>SALES (93)</b>	212.557.777,20	214.459.098	90.533.806,32	89.966.843	478.726.203,1	477.969.094
	<i>p: 0,631</i>		<i>p:0,13</i>		<i>p:0,5</i>	
<b>NIBT (93)</b>	15.885.214,93	15.203.538,89	5.505.655,31	5.417.222,59	44.353.695,46	36.591.889,09
	<i>p: 0,653</i>		<i>p:0,580</i>		<i>p:0,05**</i>	
<b>NI (87)</b>	10.674.965	11.041.559	3.311.537	3.347.849	29.083.866,85	26.613.499,97
	<i>p: 0,742</i>		<i>p:0,162</i>		<i>p:0,25</i>	
<b>ROE (86)</b>	0,059317953	0,078115116	0,07775	0,0825	0,300082963	0,23879216
	<i>p: 0,534</i>		<i>p:0,917</i>		<i>p:0,05**</i>	
<b>ROA (87)</b>	0,030450575	0,0368908	0,0289	0,0299	0,055540551	0,07500275
	<i>p: 0,290</i>		<i>p:0,44</i>		<i>p:0,01***</i>	
<b>ATO (93)</b>	0,88988925	0,841219	0,8016	0,716	0,58669253	0,544861
	<i>p: 0,002***</i>		<i>p:0,003***</i>		<i>p:0,25</i>	
<b>LEV (92)</b>	2,1916	2,91172	1,4639	1,4465	2,928001	5,77696
	<i>p: 0,161</i>		<i>p:0,028**</i>		<i>p:0,01***</i>	
<b>PM (87)</b>	0,037450575	0,041396552	0,0351	0,0439	0,08951685	0,092984882
	<i>p: 0,572</i>		<i>p:0,258</i>		<i>p:0,4</i>	

All numbers are in Euros.

The difference in mean is based on pairwise t-tests, the difference in median is based on signed rank test and the difference in standard deviation is based on F criterion. \*, \*\*, \*\*\* statistically significant at 0.10, 0.05 and 0.01, respectively.

Definitions: TFA: Total fixed assets, TCA: Total current assets, TA: Total assets, BV: Book value of equity, TL: Total liabilities, NIBT: Net income before taxes, NI: Net income, ROE: Return on equity, ROA: Return on assets, ATO: Assets turnover, LEV: Leverage, PM: Profit margin, p: Two-tailed p-value of the difference between IAS and GAS accounting numbers

**TABLE 4**

Pearson correlation coefficients on variables used in model (1)

$$P_{it} = a + b BV_{it} + c NI_{it} + e_{it}$$

Panel A:GAS	P	BV	NI
P	1,000		
	0,000		
BV	<b>0,478***</b>	1,000	
	0,000	0,000	
NI	<b>0,831***</b>	<b>0,55***</b>	1,000
	0,000	0,000	0,000
Panel B: IAS			
P	1,000		
	0,000		
BV	<b>0,571***</b>	1,000	
	0,000	0,000	
NI	<b>0,736***</b>	<b>0,620***</b>	1,000
	0,000	0,000	0,000

Definitions

P: price per share at the end of the fiscal year  $t$

BV: Book value per share for firm  $i$  at the end of fiscal year  $t$

NI: Net income per share for firm  $i$  at the end of fiscal year  $t$

\*, \*\*, \*\*\* statistically significant at 0.10, 0.05 and 0.01, respectively

**TABLE 5**

Relative value relevance of book value and net income under GAS and IAS (Model 1)

$$P_{it} = a + b BV_{it} + c NI_{it} + e_{it}$$

	BN only models			NI Only Models			BV and NI Models			
	Intercept	BV	R <sup>2</sup>	Intercept	NI	R <sup>2</sup>	Intercept	BV	NI	Adj R <sup>2</sup>
N = 83										
<b>GAS</b>										
<i>coefficients</i>	0,768	<b>1,35***</b>	22,9%	<b>1,846***</b>	<b>9,577***</b>	69%	<b>1,537***</b>	0,215	<b>8,532***</b>	66,3%
<i>p - value</i>	0,363	0		0	0		<b>0,001</b>	0,137	0	
<b>IAS</b>										
<i>coefficients</i>	0,447	<b>1,36***</b>	32,6%	<b>2,19***</b>	<b>7,93***</b>	54,2%	<b>1,176**</b>	<b>0,534***</b>	<b>6,093***</b>	54,6%
<i>p - value</i>	0,548	0		0	0		<b>0,021</b>	<b>0,005</b>	0	
<b>GAS - IAS</b>										
<i>coefficients</i>	0,321	-0,01	-9,7%	-0,344	<b>1,647*</b>	14,8%	0,361	-0,319	2,439**	11,7%
<i>p - value</i>	0,3877	0,489	0,459	0,2619	<b>0,0633</b>	0,404	0,321	0,134	0,398	0,411

Definitions

P: Price per share at the end of the fiscal year *t*

BV: Book value per share for firm *i* at the end of fiscal year *t*

NI: Net income per share for firm *i* at the end of fiscal year *t*

The tests in coefficients are based on t-tests. The tests in adjusted R-squares are based on Young Tests (Young, 1989).

Two tailed p-values are used. \*, \*\*, \*\*\* statistically significant at 0.10, 0.05 and 0.01, respectively

TABLE 6

Pearson correlation coefficients on variables used in model (2)

$$P_{it} = a + b BV\_IAS_{it} + c BV\_DIF_{it} + d NI\_IAS_{it} + e NI\_DIF_{it} + e_{it}$$

	P	BV_IAS	BV_DIF	NI_IAS	NI_DIF
P	1,000 0,000				
BV_IAS	<b>0,571***</b> 0,000	1,000 0,000			
BV_DIF	<b>-0,296***</b> 0,007	<b>-0,534***</b> 0,000	1,000 0,000		
NI_IAS	<b>0,736***</b> 0,000	<b>0,620***</b> 0,000	<b>-0,261**</b> 0,017	1,000 0,000	
NI_DIF	0,109 0,329	-0,198 0,072	0,170 0,124	<b>-0,356***</b> 0,001	1,000 0,000

Definitions

P it: Price per share for firm *i* at the end of the fiscal year *t*

BV IAS it: Book value per share reported under IAS for firm *i* at the end of fiscal year *t*

NI IAS it: Net income per share reported under IAS for firm *i* at the end of fiscal year *t*

BV\_DIF it: The difference between GAS and IAS book value per share for firm *i* at the end of fiscal year *t*

NI\_DIF it: The difference between GAS and IAS net income per share for firm *i* the end of fiscal year *t*

\*, \*\*, \*\*\* statistically significant at 0.10, 0.05 and 0.01, respectively

**TABLE 7**

Incremental value relevance of GAS adjustments to book value  
and net income (Model 2)

$$P_{it} = a + b BV\_IAS_{it} + c BV\_DIF_{it} + d NI\_IAS_{it} + e NI\_DIF_{it} + e_{it}$$

	<b>Intercept</b>	<b>BV_IAS</b>	<b>BV_DIF</b>	<b>NI_IAS</b>	<b>NI_DIF</b>	<b>Adj R<sup>2</sup></b>
<i>coefficients</i>	<b>1,204**</b>	<b>0,419*</b>	-0,316	<b>7,187***</b>	<b>7,977***</b>	65,5%
<i>p – value</i>	<b>0,038</b>	<b>0,055</b>	<b>0,213</b>	0	0	

Definitions

P<sub>it</sub>: Price per share for firm *i* at the end of the fiscal year *t*

BV IAS<sub>it</sub>: Book value per share reported under IAS for firm *i* at the end of fiscal year *t*

NI IAS<sub>it</sub>: Net income per share reported under IAS for firm *i* at the end of fiscal year *t*

BV\_DIF<sub>it</sub>: The difference between GAS and IAS book value per share for firm *i* at the end of fiscal year *t*

NI\_DIF<sub>it</sub>: The difference between GAS and IAS net income per share for firm *i* at the end of fiscal year *t*

Two tailed p-values are used. \*, \*\*, \*\*\* statistically significant at 0.10, 0.05 and 0.01, respectively