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FINANCIAL DECISION MAKING AND THE ADOPTION OF IFRSs: EVIDENCE FROM GREEK LISTED FIRMS

By

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Abstract

The impact of the application of IFRSs to the accounting ratios and financial decision making models and systems has been mostly ignored in the current literature. As the changes in the accounting standards can lead to different values for the accounting ratios, and therefore to different information and, possibly, to different decisions, this issue can be very important for financial analysts and financial decision makers. This study aims to examine the differences of the disclosed financial information, in the form of accounting ratios, derived from the companies' Financial Statements prepared in conformity with Greek – Local General Accepted Accounting Principles (Greek - GAAP), or in conformity with IFRSs. The sample used, includes all the manufacturing firms listed in Athens Stock Exchange at 2005. A variety of financial decision models available in the literature are employed in order to investigate the differences in the decisions arising from the use of IFRSs. The differences in the information and the decisions are presented and analysed and the results are discussed thoroughly. JEL Classifications: M40, M41.

Keywords: Financial Accounting, Accounting Standardization, International Financial Reporting Standards, Financial Decision Making.

1. Introduction

Financial information provided by the companies' published financial statements, is the major means of their communication with all agents that compose the "market". This information is used by the financial analysts and decision makers as an input to their analyses that affect the present and the potential financial prospects of the firms, usually with the aid of a decision model, in order to support financial decisions i.e. decisions on credit granting, investment etc. The ability of these decision models and consequently of the analyses to support efficiently financial decision making is based on the quality of the input data i.e. the information drawn from the published financial statements.

The purpose of the International Financial Reporting Standards (IFRSs) was to harmonize the accounting standards in different countries and to improve the quality of the information. Obviously, the switch from Local Generally Accepted Accounting Principles (GAAP) to IFRSs has an impact to the financial measures presented in the financial statements. The differences between the financial statements of a company prepared in conformity with Local GAAP and IFRSs cannot be globally predicted as they depend on the differences between the Local GAAP and IFRSs, the use of specific investment, financing and operating practices in the country and the industry, as well as the strategy of the companies.

Financial decision making is usually based on the application of models, able to support the relevant decisions. Such models are the classical credit scoring and bankruptcy prediction models, the models supporting portfolio construction decisions, etc. There is a plethora of methodologies employed in the past for the construction of these models and various models able to support financial decisions, embodied or not in decision support systems, have been proposed in the literature. The development and the application of these models require the use of financial measures, mainly in the form of key accounting ratios and various transformations of them.

The question arising is whether and to what extent the changes in the accounting standards lead to different values for the accounting ratios, and therefore to different information and, possibly, to different decisions. The answer to this question is very important in the light of the current state and the relative trends of the IFRSs adoption. In many countries that have already adopted IFRSs, the presentation of financial statements under IFRSs is not obligatory for all the firms, although there is an expressed trend for an extensive implementation of the IFRSs by all the firms operating in these countries.

The effect of the changes in the information provided under the new accounting regime cannot be answered only by defining the average changes of the main elements of the financial statements. Such a handling is not adequate as these elements are used for the calculation of accounting ratios and the changes in the nominators and denominators of the ratios can result to small or large changes in the values of the ratios and the ratios statistics for an industry or a market.

Furthermore, the decision makers can take under consideration the changes for each specific industry, when performing an analysis of a company in order to support some decision about lending to the company, investing in the com-

pany etc. But the question on the effect of the change has to be also answered into a more complex framework, where more ratios are involved in the decision. Researchers and practitioners have admitted, long ago, that financial predictions and decision making cannot be based on a single ratio analysis but there is a need to involve more than one ratios in the relevant decision models. Models for bankruptcy prediction, credit scoring, stock evaluation etc have been developed using a combination of accounting ratios. It is possible that the simultaneous change of various elements and accounting ratios can lead to totally different decisions. The investigation of the changes can lead to conclusions relative to the adjustments that have to be made to the existent decision models and the handle of their proposals under the new circumstances.

Therefore, this paper aims to examine the differences of the disclosed financial information, in the form of accounting ratios, derived from the companies' Financial Statements prepared in conformity with Greek – Local General Accepted Accounting Principles (Greek - GAAP), or in conformity with IFRSs. The paper is a first attempt to study the effect of the IFRSs adoption in the information provided with the exception of studies focusing only on the changes of the Profit and Loss Account and Net Worth of the companies made by accounting professionals. The present study proceeds to examine these differences in a decision making context with a reference to companies listed in Athens Stock Exchange (ASE).

The paper is structured as follows: The first section presents the framework of switching from Greek - GAAP to IFRSs and the main changes in the accounting regime. The next section presents the methodology and the data employed in this investigation.. The last section analyses the differences arising in a decision support environment, by presenting the changes from the application of IFRSs instead of the Greek - GAAP, for the manufacturing companies listed in ASE. Finally, the main findings are summarised and the directions for future research are discussed in the concluding section.

2. The new accounting framework in Greece

In Anglo-Saxon countries there is an emphasis on disclosure and shareholders interests, and the major function of financial statements has been on providing information to investors. Financial accounting was always separate from tax accounting, and professional accounting standards have been developed. In other countries, such as Greece, tax and other governmental rules was the major influence on the accounting system. Financial reporting in Greece was

heavily influenced by tax avoidance strategies and Greek - GAAP lack detailed disclosures designed to satisfy the information needs of investors and financial analysts. Because of these complexities, the use of mutual recognition may increase the lack of comparability and impede the flow of capital (Taylor and Jones, 1999).

Financial reporting regulations for all the Greek firms were formed and managed either by Parliament or other governmental bodies. The major governmental bodies issuing rules were the Ministry of Finance and the Ministry of Development. The "National Council of Accounting", a specialised body which issued opinions on topics relevant to financial reporting, had also material influence on accounting framework. Also the academic community and the Board of Chartered Accountants had a significant role on the development of accounting practice in Greece. The most important sources of accounting rules for companies listed in the ASE, could on the whole be found in the Greek Commercial Law, the Stock Exchange Law, the Documents Code, which promote the acceptance of accounting principles by both the tax authorities and the General Greek Accounting Plan. Nonetheless, financial reporting was influenced by the taxation Laws.

European Union countries adopted the European Regulation EC 1606/2002 on the application of International Accountant Standards (IAS). In the case of EU countries, the EU legislation requires listed companies to comply with IFRSs, but leaves it to Member States to decide for the non-listed firms about the accounting standards they should follow. The transition procedure from the Local GAAP to the IAS/IFRSs was set by European Commision, for the European countries accordingly with IFRSs 1 on "First Time Application of International Financial Reporting Standards". This standard explains how a company should make the transition to IFRSs from any Local GAAP.

Various differences have been reported by scholars and academics between Local Generally Accounting Accepted Principles (Local GAAP) and IFRSs (c.f. Nobes, 2001). Researchers have studied the dissimilarities in the disclosed information between Local GAAP and IFRSs. This research has shown that the differences in the disclosed information are associated with various country-specific factors. Ding *et al.*, (2005), indicate that these differences can be explained by cultural values, while Ding *et al.*, (2006), conclude that the variation in Local GAAP from IFRSs is positively affected by economic development and the importance of the accounting profession and is negatively affected by the capital market development in each specific country.

In Greece, all listed companies have been required to use IFRS for the preparation and presentation of their financial statements from 2005. For the firms listed in ASE both the consolidated and the individual financial statements, for the fiscal years starting on or after January 1st, 2005, have to be prepared in conformity with IFRSs (c.f. Street and Larson, 2004).

The requirement for comparability of financial information, provided by the financial statements for the year of application (2005) and the previous year of transition (2004), led to the restate of both the consolidated and the separate financial statements for 2004 prepared in conformity with Greek - GAAP in order to be comparatively presented along with the financial statements for 2005 prepared in conformity with IFRS. This subject was of significant importance for both the investors and the financial analysts of the listed companies (c.f. Apostolou and Papadimos, 2005).

3. Methodology and data

As the aim of the study is to compare the information derived from the financial statements prepared according to Greek - GAAP or according to IFRSs. The analysis will concentrate on the disclosed financial information, for year 2004, through each individual company's financial statements, derived in the form of accounting ratios. A two stage comparison can be performed. At a first stage the comparison can focus in the investigation of the differences in the statistical characteristics of the ratios. In a second stage the information can be compared through the evaluation results of financial decision making models. The stability of the proposals of the models can be used as an indicator of the similarity of the information derived from the financial statements under different accounting rules. For homogeneity purposes, the present study is focusing on a sample consisting of all the manufacturing firms listed in ASE at 2006 that published financial statements for the year ended 31 December, 2005.

At first, a large (but not exhaustive) set of accounting and market based ratios of the firms was calculated for a total of 109 companies. The accounting ratios drew from two sets of financial statements one set from the published financial statements, prepared in conformity with Greek - GAAP, and another set from the adjusted to IFRSs relevant financial statements, for each firm, as have been disclosed comparatively with published financial statements of 2005. The data were derived from the Annual Reports of the firms. The disclosed financial statements accordingly to Greek - GAAP, were adjusted using the notes of the detailed information provided by the Auditor's Report (for more

details on the notes included in Greek Auditor's Reports see Spathis *et al*., 2003).

Researchers have proposed numerous accounting ratios, suitable for financial decision making. The selection of the ratios in this study was based mainly on the theoretical framework presented by Courtis (1978), the empirical work of previous researchers which refer to the Greek market (c.f. Tsamis, 1991), the ratios used in various financial decision support models worldwide (c.f. Dimitras *et al*., 1996) and more recent studies indicating the accounting ratios used in financial decision making (c.f. Berry and Robertson, 2006). The main limitation in the selection of the measures to be included in the analysis was the unavailability of the trends of ratios or of any other financial indicators.

As far as even minor statistical differences in the ratios are somehow expected and they can be analysed, this analysis cannot provide an icon on the possible changes in the decisions based on these ratios. Differences in single ratios can be statistically important or not but the financial decisions are based on more than one ratios and the question is on the additive effect of these differences. This effect can be derived only by using the specific set of ratios employed and the same decision process in financial decision making.

In the present study, in order to investigate the effect of the application of IFRSs in financial decision making we employed multiple criteria classification models developed for decision making in financial management. Classification models are those used to classify in groups that are defined in a nominal way. The models to be employed should cover as much as possible decision making cases in financial management (see also Zopounidis and Doumpos, 2002): business failure prediction, credit risk assessment and stock evaluation. The typical procedure for the development of such models includes the model estimation based on the data of a sample of firms and then the evaluation of the models results using a different data set. In this study we make use of the classification results and thus the decision proposals of these models when they are applied to data sets of the firms derived in conformity with Greek - GAAP and IFRSs, in order to explore the differences in the decision proposals. The development of new models based on the available data is beyond the scope of this paper as the available data samples are not large enough and the model developing procedure would be under question.

Therefore we have chosen to use models based on Greek firm's data that have been developed using different methods. Furthermore, the development of the models had to be based on data sets from periods as close to 2004 as pos-

sible and to be able to cover financial decision making affecting manufacturing companies. Researchers such as Mensah (1984) have already noted that different economic environments as well as different sectors can lead to different prediction models in the area of finance. The models we finally selected to use have been proposed in the studies of Dimitras (1995), Doumpos *et al*., (2002), and Dimitras (2002).

Dimitras (1995) employed the ELECTRE TRI method for bankruptcy prediction in Greece using a sample of 40 firms that went bankrupt, according to the Greek law, during the years 1986 to 1990. More details about bankruptcy prediction models are provided by Dimitras *et al*., (1995) and by Balcaen and Ooghe (2006), among others. The ELECTRE TRI method belongs to the family of ELECTRE multicriteria methods that adopt the concept of outranking. The particularity of the ELECTRE family is that it refuses the possibility of total compensation between the alternative's performances on the criteria, and accepts incomparability and intransitivity. ELECTRE TRI method, presented by Yu (1992), is based on ELECTRE III method. The model presented by Dimitras (1995) is classifying firms into three classes: healthy firms (Class 1), firms that are likely to go bankrupt (Class 0), and firms for which there is an uncertainty in the evaluation (Class U). Table 1 presents the accounting ratios employed and the weights of them. For comparability reasons, a discriminant analysis model (c.f. Altman, 1983), using the same ratios, was also presented in this study. The discriminant model classifies firms into two classes: healthy firms (Class 1) and firms that are likely to go bankrupt (Class 0). The accounting ratios employed along with the discriminant function coefficients are presented in Table 2.

Doumpos *et al*., (2002), presented some models for credit scoring, using the financial characteristics of a large sample of firms for the years 1994-1997. They employed Discriminant analysis and Logit analysis (c.f. Ohlson, 1980) among others. The models presented in this paper classify the firms under study into two classes:

1. firms that should be granted a credit (Class 1) and
2. firms that are considered of high credit risk and for which the credit application should be rejected (Class 0).

The accounting ratios used for the development of the above models and the coefficients of the models are presented in Table 3.

TABLE 1

Accounting and market ratios employed in the financial decision support models Profile, relative thresholds and weights in the study of Dimitras (1995)

Accounting ratios	Profile (r)	Indifference threshold (q)	Preference threshold (p)	Veto threshold (v)	Weight (w)
Net Income / Total Assets	0.050	0.050	0.160	0.200	1.000
Net Income / Net Worth	0.250	0.003	0.020	0.100	1.000
Current Assets / Current Liabilities	1.300	0.200	0.300	0.500	1.400
(Current Assets - Inventories) / Current Liabilities	0.800	0.050	0.200	0.300	1.400
Total Debt / Total Assets	80.0 % %	1.0 %	5.0 %	15.0 %	1.200
Net Worth / Fixed Assets	0.350	0.100	0.150	0.200	1.100

TABLE 2

Accounting ratios and coefficients in the discriminant analysis model in the study of Dimitras (1995)

Accounting ratios	Coefficients
Net Income / Total Assets	2.34424
Net Income / Net Worth	0.21736
Current Assets / Current Liabilities	1.22616
(Current Assets - Inventories) / Current Liabilities	-0.63523
Total Debt / Total Assets	-0.10720
Net Worth / Fixed Assets	0.07653
Constant term	-1.05325

TABLE 3

Accounting ratios and coefficients in the logit and discriminant analysis models in the study of Doumpos *et al*. (2002)

Accounting ratios	**Logit Coefficients**	**Discriminant Coefficients**
Earnings Before Interest And Taxes / Total Assets	43,5548	0,6118
Net Income / Net Worth	-0,2557	-0,1381
Sales / Total Assets	10,9729	0,7604
Gross Profit / Total Assets	-15,3934	0,3609
Net Income / Working Capital	3,819	0,0381
Total Debt / Total Assets	-11,5096	-0,3398
Long-Term Debt / (Long-Term Liabilities + Net Worth)	1,9235	-0,056
(Current Assets - Inventories) / Current Liabilities	0,0448	0,005
Accounts Receivable / Current Liabilities	0,3234	0,0006
Current Liabilities / Net Worth	-0,023	-0,0596
Total Debt / Working Capital	0,1365	0,0009
Constant term	1,7478	0,2952

In the field of securities' evaluation, Dimitras (2002) produced a model using the multicriteria method UTADIS (UTilités Additives DIScriminantes). UTADIS is a monotone regression method and was proposed by Doumpos and Zopounidis (1998). The aim of this model is to sort the securities of the construction industry companies listed in Athens Stock Exchange (ASE) into four groups/classes:

Class A: securities of leader companies in the industry, companies that drive the progress of the industry. These securities are considered as "blue chips» in ASE.,

Class B: acceptable securities of rather stable and profitable companies with good prospects,

Class C: uncertain securities of companies having not clearly good prospects that need careful study before investing on them,

Class D: unacceptable securities.

The model in the study of Dimitras (2002) incorporates not only quantitative measures, but also the knowledge as well as the preferences of experts for the development of the models. The data used for the development of the model are from the period 1995-1996. Data were collected from (a) the yearly bulletin of ASE that contains balance sheet and income statement's data of corporations in ASE as well as other information and (b) the yearly statistical publications of ASE for 1995 and 1996 that contains data and information on the transactions for each year. The accounting ratios and the market ratios employed as criteria in the model as well as the global utility function weights of the models are presented in Table 4.

TABLE 4

Criteria and global utility function weights in UTADIS model of Dimitras (2002)

Criteria	**Global utility function weights**
EBT / Shareholders Equity	10,549
Fixed Assets / Total Assets	9,493
P/E	0,001
Market Value / Book Value	17,777
Growth / (P/E)	0,755
Total Value Of The Non-Completed Part Of Contracts / Sales	12,803
Dividend Yield	0,001
Marketability	21,349
Sales Volume	27,270

It is obvious that not all of the models above are based on data from periods much before 2004. This can be considered as a problem if the models were employed in an evaluation and decision making procedure as has been mentioned by various researchers. But the objective of the present study is not to evaluate the firms or the securities or to compare the results of the different models employed. The study focuses on the information that can be derived from the decision support models and the possibility of getting different evalu-

ations from the models when the information is derived from the financial statements of the construction industry firms after the adoption of IFRSs. The evaluation of the same firms using two different data sets and the comparison of the results eliminates the effect of the time or even the industry impact in the study. Any changes recorded in the evaluation can be supposed to be dependent on the different accounting standards and not to the models employed.

4. Results

Professional accountants and auditors, in the course of their work on preparation and restatement of the financial statements from Greek - GAAP to IFRSs during the application year 2005, identified substantial differences on the following elements of the financial statements of the Greek firms: Assets, Intangible Assets, Taxation, Investments / Subsidies - Associated Companies, Provisions and Construction Contracts. These differences affect the Total Assets and Liabilities, as well as the Profit and Loss Accounts and the Net Worth of the companies.

In particular, the differences on the elements of the manufacturing companies' financial statements are mainly due to Greek - GAAP rules that are "dissimilar" to the IAS/IFRSs rules as mentioned by Nobes (2001). These Greek - GAAP rules that are causing the differences are the following (the relevant IAS/IFRS rules are noted into parentheses for each case)

- Assets
  (a) Land and buildings are re-valued periodically (currently every four years) based on coefficients provided by taxation law rather than being based on fair values (IAS16.29); (b) finance leases are not capitalized; lease payments are not necessarily recognized on a straight-line basis (IAS 17.12/28/25).

- Intangible Assets
  (a) The research costs and pre-operating costs are capitalized (IAS 38.42/56), (b) capitalization of borrowing costs are reflected as intangibles and amortized over five years and not added to the carrying cost of the related asset (IAS 23.11), (c) foreign currency losses on loans denominated in foreign currency which have been used (IAS 21.15);(d) the acquired fixed assets are deferred and amortized over the repayment period of the loan (SIC 11), (e) goodwill is written off directly against equity (IAS 22.40). Also, the Greek - GAAP do not have specific rules on recognition and measurement for: (f) the treatment of internally generated brands

and similar items, although they are not normally capitalized (IAS 38.51) and (g) the measurement of impairment of intangible assets (IAS 36).

- Taxation
  The Greek - GAAP do not have specific rules on recognition and measurement in relation to the accounting for deferred tax (IAS 12).

- Investments /Subsidies - Associated Companies
  (a) Some subsidiaries with significantly dissimilar activities from the rest of the group are excluded (IAS 27.14); (b) the classification of business combinations between uniting of interests and acquisitions is made on the basis of legal form rather than on whether an acquirer can be identified (IAS 22.8-16); (c) subsidies received for the acquisition of fixed assets are reflected as a component of shareholders' equity and amortized using the same rate as that used to depreciate the related assets (IAS 20.24) and (d) there are no requirements concerning the treatment of lease incentives (SIC 15). Also, the Greek - GAAP have no specific rule requiring disclosures associated to (e) Related party transactions, except for balances resulting from transactions that are not in the normal course of business (IAS 24).

- Provisions
  (a) provisions are recognized, based on tax legislation, in cases where there is no obligation at the balance sheet date (IAS 37.14) and (b) provisions are not generally discounted (IAS 37.45).

- Construction Contracts
  Costs and revenues on construction contracts are not necessarily recognized on a stage of completion basis (IAS 11.22).

These differences, were expected to be the cause of important changes in the financial statements of Greek listed firms. It was expected that the Total Assets and Liabilities of companies, as well as the Profit and Loss Accounts and Net Worth accordingly to the IFRSs would exhibit important differences from the Greek - GAAP.

The above differences lead to changes in the amounts of the financial statements accounts prepared in conformity with Greek - GAAP and IFRSs.

4.1 Statistical analysis of the accounting ratios

The differences in the financial information obtained from the financial statements prepared in conformity with the Greek - GAAP and the IFRSs for

the 109 manufacturing companies of the sample are shown in Table 5. This table presents the statistical characteristics for the accounting ratios, as well as the results of paired t-test regarding the differences in the means of the financial ratios.

The performed t-test for the means showed that the difference in the means is statistically significant at 0.01 level for the ratios: Long-term debt / (Long-term debt +Net Worth), Long-term debt / Net Worth, Net Worth / Fixed Assets, Net Worth / Total Assets, Sales / Fixed Assets, Total Debts / Net Worth, Total Debts / Total Assets. The ratios for which the differences in the means are statistically significant at the 0.05 level were: Net Income / Net Worth, Net Income / Total Assets, Sales / Receivables, Sales / Total Assets. Lastly, the difference in the means is statistically significant at 0.1 level for the Net Income / Sales ratio.

The above differences in the mean values for most of the ratios can be very important in a decision – making context. But it has to be mentioned that the changes in the mean values of the ratios can lead to conflicting estimations of the financial performance of the firms after the IFRS adoption. For example, the mean values of the liquidity ratios (the ratios Current Assets / Current Liabilities and (Current Assets - Inventories) / Current Liabilities) are higher in the case of the IFRSs based financial statements, while the mean value of the debt ratio (Total Debt / Total Assets) is significantly lower in the case of the Greek - GAAP based financial statements. It is obvious that it is not easy to state that the mean financial performance of the firms, according to the values of the accounting ratios, seems to be higher when their financial statements are published under the Greek - GAAP or IFRSs.

It is the importance of the ratios employed in a decision support model that defines the possible changes in the evaluations and the decisions. Furthermore, in a decision making process, the changes in the information derived for each single company are crucial for the evaluation of the specific company and the statistical differences in the industry or the market are of much lower importance, although the new mean values can be used for benchmarking.

TABLE 5

Statistical characteristics for accounting and market ratios calculated from the financial statements of manufacturing companies listed in ASE prepared in conformity with Greek - GAAP and IAS/IFRSs for 2004.

	Greek-GAAP		IAS/ IFRSs		
ACCOUNTING RATIOS	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**t-statistic**
Current Assets / Current Liabilities	2.055	2.097	2.193	3.295	0.857
Current Liabilities / Net Worth	0.738	0.667	0.906	1.329	1.593
Cost of Sales / Sales	0.860	0.718	0.784	0.182	1.145
Depreciation / Sales	7.444	5.811	6.408	14.080	0.707
EBIT / Interest Expenses	33.53 3	165.24 4	36.81 1	188.5 20	- 0.704
EBIT / Total Assets	5.292	6.448	4.592	7.596	1.527
Gross Profit / Sales	13.99 5	71.788	21.60 8	18.16 6	- 1.145
Gross Profit / Total Assets	- 0.050	1.858	0.124	0.111	- 0.960
Long-Term Debt / (Long-Term Debt+Net Worth)	0.164	0.181	0.248	0.190	-** 7.673*
Long-Term Debt / Net Worth	28.90 2	48.527	47.99 0	71.44 9	-** 4.884*
Net Income / Net Worth	7.421	20.294	1.937	32.457	2.394**
Net Income / Sales	5.526	55.424	3.614	59.282	1.781*
Net Income / Total Assets	4.014	6.898	3.098	8.024	2.061**
Net Income / Working Capital	- 0.239	3.392	-0.138	3.613	- 0.249
Net Worth / Fixed Assets	1.407	0.926	1.132	0.760	** 4.753*
Net Worth / Total	55.84		52.19	18.06	**

continues

Assets	0	17.114	6	9	3.995*
(Current Assets - Inventories) / Current Liabilities	1.472	1.486	1.583	2.462	-0.834
Receivables / Current Liabilities	1.163	0.904	1.157	1.349	0.092
Sales / Fixed Assets	1.854	2.731	1.619	3.056	2.695*
Sales / Net Worth	1.384	1.537	1.401	1.385	0.222
Sales / Receivables	2.334	1.741	2.768	2.600	2.423**
Sales / Total Assets	0.624	0.420	0.590	0.405	2.225**
Sales / Working Capital	3.603	38.994	-2.790	1	0.151
Total Debt / Net Worth	102.6 68	92.179	138.6 25	180.4 85	-** 2.683*
Total Debt / Total Assets	44.13 0	17.111	47.79 2	18.08 1	-** 4.008*
Total Debt / Working Capital	4.239	44.105	-2.374	30.60 8	0.372

*Note: *significant at 0.1 level, ** significant at 0.05 level, *** significant at 0.01 level.*

4.2 Analysis of the decision models results

The five different decision support models were applied using the accounting and market ratios. The classification of all the 109 manufacturing firms of the sample according to the three models is presented in Appendix. The names of the classes in the Appendix are coded as follows: For the ELECTRE TRI and Discriminant Analysis models of Dimitras (1995), "1" stands for the class of healthy firms, "U" stands for the class of firms that cannot be classified as healthy or bankrupt with certainty and "0" stands for the class of bankrupt firms. For the Logit and Discriminant Analysis models provided by Doumpos *et al*., 2002), "1" stands for the class of the firms that are to be financed and "0" stands for the class of firms of which the credit application is to be rejected. For the UTADIS model presented by Dimitras (2002), symbols A, B, C and D stand

for the four categories in which the model classifies the securities. The classification of the firms by the models is not identical as the classes are defined in different ways in the studies and the decision context is different.

It has to be mentioned again that the present study does not evaluate the models and their predictions. The evaluation of the classifications provided should be based on the performance of firms and securities during the years after 2004. For example, to our knowledge, no one of the firms in the sample went bankrupt for the next two years 2005 and 2006. So, classifications in the "bankruptcy" category by the two bankruptcy prediction models should be considered as misclassifications (Type II errors). Such an analysis is beyond the scope of this study. Anyway, the bankruptcy prediction models are mostly used by decision makers as "early warning systems" and the proposals of them are considered into the examination of firms along with other kind of information.

Table 6 summarises the classification provided by the five models for the firms of the sample. We have to mention again that UTADIS model (Dimitras, 2002) was applied only for the 22 construction companies included in the sample.

It can be easily derived from Table 6 that, in average, the firms of the sample are classified to lower classes when the information employed is derived from the financial statements prepared in conformity with IFRSs instead of Greek - GAAP. The number and the percentage of firms classified in the "lower" classes, increases for all the models, indicating that the firms and securities under evaluation are downgraded the information employed is derived from the IFRSs based financial statements.

A further analysis of these differences has to be performed if we consider that the differences in the number of the firms classified are the result of simultaneous upgrades and downgrades of firms. A small difference in the classification percentages could be the effect of a huge number of reclassifications. In order to scrutinize this aspect, Table 4 summarizes the reclassifications of firms made when shifting from Greek - GAAP to IFRS for all the models. Specifically, Table 7 presents for each model the number and the percentage of reclassifications by category as well as the number and the percentage of firms classified in the same class by the models. The name of each reclassification category in Table 4 reflects the upgrade or downgrade ("+" or "-" respectively), and the number of classes of difference in the reclassification. The "0" category respects to the firms that their classification remained stable.

TABLE 6

Classification analysis of the firms using the five models

		Greek - GAAP		IFRSs	
	Class	**Number of firms**	**%**	**Number of firms**	**%**
ELECTRE TRI (Dimitras, 1995)					
	1	79	72,48%	71	65,14%
	U	21	19,27%	21	19,27%
	0	9	8,26%	17	15,60%
Discriminant Analysis (Dimitras, 1995)					
	1	73	66,97%	71	65,14%
	0	36	33,03%	38	34,86%
Logit (Doumpos *et al*., 2002)					
	1	97	88,99%	92	84,40%
	0	12	11,01%	17	15,60%
Discriminant Analysis (Doumpos *et al*., 2002)					
	1	103	94,50%	101	92,66%
	0	6	5,50%	8	7,34%
UTADIS (Dimitras, 2002)					
	A	8	36,36%	7	31,82%
	B	0	0,00%	0	0,00%
	C	5	22,73%	3	13,64%
	D	9	40,91%	12	54,55%

TABLE 7

Reclassification analysis of the firms using the five models

	Change of Class						
	-3	**-2**	**-1**	**0**	**+1**	**+2**	**+3**
ELECTRE TRI (Dimitras, 1995)							
number of firms	-	5	13	85	5	1	-
		4.59	11.93	77.98	4.59	0.92	
%		*%*	*%*	*%*	*%*	*%*	
Discriminant Analysis (Dimitras, 1995)							
number of firms	-	-	10	91	8	-	-
			9.17	83.49	7.34		
%			*%*	*%*	*%*		
Logit (Doumpos *et al*., 2002)							
number of firms	-	-	8	98	3	-	-
			7.34	89.91	2.75		
%			*%*	*%*	*%*		
Discriminant Analysis (Doumpos *et al*., 2002)							
number of firms	-	-	5	101	3	-	-
			4.59	92.66	2.75		
%			*%*	*%*	*%*		
UTADIS (Dimitras, 2002)							
number of firms	2	0	3	15	1	0	1
	9.09	0.00	13.64	68.18	4.55	0.00	4.55
%	*%*	*%*	*%*	*%*	*%*	*%*	*%*

The number (and the percentage) of the reclassified firms is not the same for all the models. The percentage of firms reclassified varies from 7.34% to 31.82%. It is interesting also to study the relation between upgraded and downgraded firms. According to Table 7, the number of the downgraded firms is higher than the number of the upgraded ones for all the models, although there does not exist a specific relation between these two numbers.

Analytically, the reclassification by ELECTRE TRI model (Dimitras, 1995) when using the financial statements prepared in conformity with the Greek GAAP and the IFRSs are as follows:

- 5 firms (4.59%) are reclassified from the "healthy" to the "bankruptcy" class ,
- 7 firms (6.42%) are reclassified from the "healthy" to the "uncertainty" class,
- 5 firms (4.59%) are reclassified from the "uncertainty" to the "bankruptcy" class
- 2 firms (1.83%) are reclassified from the "bankruptcy" to the "uncertainty" class,
- 3 firms (2.75%) are reclassified from the "uncertainty» to the "healthy" class and
- 1 firm (0.92%) is reclassified from the "bankruptcy" to the "healthy" class

The differences in the classification of the firms, by the Dimitras (1995) Discriminant Analysis model are

- 10 firms (9.17%) are reclassified from the "healthy» to the "bankruptcy" class and
- 8 firms (7.34%) are reclassified from the "bankruptcy" to the "healthy" class.

The reclassifications provided by the Doumpos *et al*., (2002) Logit model are

- 8 firms (7.34%) are reclassified from the "acceptable" to the "rejection" class and
- 3 firms (2.75%) are reclassified from the "rejection" to the "acceptable" class.

According to the Doumpos *et al*., (2002) Discriminant Analysis model the 7.34% of the firms are reclassified as follows:

- 5 firms (4.59%) are reclassified from the "acceptable" to the "rejection" class and
- 3 firms (2.75%) are reclassified from the "rejection" to the "acceptable" class.

Finally, the application of the UTADIS model (Dimitras, 2002), on the construction industry securities provided also reclassifications. In total, 7 out of the 22 securities (31.82%) are reclassified. Two securities are upgraded i.e. reclassified to a higher group and five securities are downgraded. Analytically:

- 1 security (4.55%) is reclassified from "not accepted" to "uncertain",
- 1 security (4.55%) is reclassified from "not accepted" to "blue chips',
- 2 securities (9.09%) are reclassified from "blue chips" to "not accepted" and
- 3 securities (13.64%) are reclassified from "uncertain" to "not accepted".

From the above reclassification analysis, it is obvious that the number of the reclassifications indicates a larger differentiation in the evaluations than the differentiation indicated from the differences in the number of firms in each class for all the models. In total, 44 out of the 109 firms of the sample (40.37%) are upgraded or downgraded by one of the models when the IFRS based accounting statements are employed instead of the Greek - GAAP based accounting statements. We also have to mention that in many cases this reclassification drives to totally different decisions, increasing the uncertainty of the models' evaluations.

Another important point is that the stability of the models' prediction and suggestions does not seem to have a specific relation with the characteristics of the models. The Logit and the Discriminant analysis models proposed by Doumpos (2002), provide the more stable suggestions. But there still exist an important number of reclassifications (10.09% and 7.34% of the evaluated firms respectively) that increase the uncertainty in the decisions.

It should be mentioned that, in total, the differences are rather important. The percentage of the firms that are reclassified varies from 9.09% to 31.82%, depending on the model used. Furthermore, in most of the cases firms are reclassified to a lower class when they are re-evaluated according to IFRSs. This indicates a more strict judgement and a weaker financial profile for the Greek manufacturing firms when they are evaluated using financial statements in conformity with IFRSs. These differences can probably mislead the financial decision makers. It is obvious that previously developed models have to be re-

constructed to reflect the effect of IFRSs in the published financial statements of the Greek companies.

5. Conclusions

The application of IFRSs for Greek listed companies have caused changes in the financial statements and consequently in the related accounting ratios, provided to financial analysts. This information, drawn from the financial statements published for 2004 in conformity with Greek - GAAP and IFRSs for the manufacturing companies listed in ASE was investigated. The statistical analysis of a set of accounting ratios usually employed in financial decision making has shown that the differences are not statistically significant for all the ratios. Yet, there are statistically significant differences for a number of ratios. The change in the ratios Long-term debt / (Long-term debt +Net Worth), Long-term debt / Net Worth, Net Worth / Fixed Assets, Net Worth / Total Assets, Sales / Fixed Assets, Total Debts / Net Worth, Total Debts / Total Assets has been proved to be the most significant. The importance of these ratios in financial decision making leads to the conclusion that the information derived under IFRSs by the financial decision makers could drive them to different decisions.

For the further investigation of the effect of the changes in information employed in financial decision making we explored the effect of the change on the decisions made when using five different financial decision support models covering the areas of business failure prediction, credit scoring and securities' evaluation. The application of these models using the financial figures for the year 2004 has shown strong evidence of differences in the ASE manufacturing companies' financial information between Greek - GAAP and IFRSs.

More specifically, the percentage of the firms that are reclassified by the models employed when using financial statements in conformity with IFRSs varies from 7.34% to 31.82% depending on the model and these reclassifications can lead to importantly different decisions. In total, 40.37% of the firms in the sample are reclassified by at least one of the employed models. In addition, the majority of the reclassifications imply the downgrading of the firms under evaluation. These findings lead to the conclusion that using the IFRSs instead of Greek - GAAP can mislead a financial decision maker on business failure prediction, credit scoring or evaluation of securities.

From the above presentation and analysis some very important issues are arising:

First, there seems to be a problem in the use of previously developed models for financial decision making. The adoption of the IFRSs, modify significantly the suggestions of these models when evaluating manufacturing firms. Therefore the existing models have to be re-examined.

Second, there exist no continuous time series of the accounting ratios calculated for the manufacturing firms listed in ASE that adopted IFRSs. This means that there is a problem in collecting data for model development and evaluation. This gap in data can drive in a great delay in the development of new evaluation models and there is no provision for the way that researchers and practitioners could deal with.

Finally, financial analysts and decision makers have to work in a risky environment with less reliable tools and have to be very careful on the way they handle financial information for the firms adopting IFRSs. It is not only they need time to get familiar to the IFRSs. It is also that they have to develop and accept new standards in order to perform analyses and evaluations on these firms.

We also have to point out that there is still a great number of firms in EU that still apply Local GAAP but they probably will have to switch to IFRSs. The International Accounting Standards Board has already proposed (February 2007) a draft of "IFRSs for Small and Medium-sized Entities". In such a case the financial decision makers will have to face a situation where previous patterns and standards in the values of the accounting ratios will be debatable and there will be a doubt on whether the decision procedures and decision support models involving accounting measures and accounting ratios should be adjusted in order to take into account the new accounting regime. Furthermore, in the framework of Basel II, banks need to develop and apply credit risk models that can be affected by the change of accounting standards if these changes reflect significant alterations in the accounting ratios.

Future research can be directed in the investigation of the extent of the phenomenon of differences in financial information obtained in other industries when adopting IFRSs. This research will allow researchers and practitioners to certify the possible differences and develop new models and standards for the Greek firms adopting IFRSs. Similar investigations in other countries that adopted IFRSs might lead to more generalised conclusions and direct researchers to techniques able to eliminate the incomparability of the data and to provide classification models capable of responding efficiently under different accounting standards.

APPENDIX

CLASSIFICATION OF THE FIRMS ACCORDING TO THE FIVE MODELS

	Dimitras (1995)				Doumpos et al., (2002)				Dimitras (2002)	
Firm	**ELECTRE TRI**		**Discriminant**		**Discriminant**		**Logit**		**UTADIS**	
	Greek GAAP	IFRS	Greek GAAP	IFRS	Greek GAAP	IFRS	Greek GAAP	IFRS	Greek GAAP	IFRS
F1	1	1	1	1	1	1	1	1	-	-
F2	1	1	1	1	1	1	1	1	-	-
F3	1	1	1	1	1	1	1	1	-	-
F4	1	1	1	1	1	1	1	1	-	-
F5	1	1	1	1	1	1	1	1	-	-
F6	1	U	1	0	1	1	1	1	-	-
F7	1	1	1	1	1	1	1	1	-	-
F8	1	0	0	0	1	1	1	1	-	-
F9	1	1	1	1	1	1	1	1	-	-
F10	1	1	1	1	1	1	1	1	-	-
F11	1	1	1	1	1	1	1	1	-	-
F12	0	U	1	1	1	1	1	1	-	-
F13	1	1	1	1	1	1	1	1	-	-
F14	U	U	1	1	0	0	1	1	-	-
F15	1	U	1	0	1	1	1	1	-	-
F16	1	1	1	1	1	1	1	1	-	-
F17	1	1	1	1	1	1	1	1	-	-
F18	1	U	1	1	1	1	0	1	-	-
F19	1	1	1	1	1	1	1	1	-	-
F20	1	1	1	1	1	1	1	1	-	-
F21	1	1	1	1	1	1	1	1	-	-
F22	1	1	1	1	1	1	1	1	-	-
F23	1	1	1	1	1	1	1	1	-	-

continues

F24	1	1	1	1	1	1	1	1	-	-
F25	1	1	1	1	1	1	1	1	-	-
F26	1	1	1	1	1	1	1	1	-	-
F27	1	1	1	1	1	1	1	1	-	-
F28	U	0	0	0	1	0	1	0	-	-
F29	1	U	1	1	1	1	1	1	-	-
F30	1	1	0	1	1	1	1	1	-	-
F31	0	0	0	0	1	1	1	1	-	-
F32	1	1	1	0	1	1	1	1	-	-
F33	1	1	1	1	1	1	1	1	-	-
F34	U	U	1	1	0	0	0	1	-	-
F35	1	1	1	1	1	1	1	1	-	-
F36	U	0	0	0	0	0	0	0	-	-
F37	U	1	1	1	1	1	1	1	-	-
F38	1	1	1	1	1	1	1	1	-	-
F39	1	1	1	1	1	1	1	1	-	-
F40	1	1	1	1	1	1	1	1	-	-
F41	1	1	1	1	1	1	1	1	-	-
F42	U	0	0	0	1	0	1	0	-	-
F43	U	U	0	1	1	1	1	1	-	-
F44	1	1	1	1	1	1	1	1	-	-
F45	1	1	1	1	1	1	1	1	-	-
F46	1	1	1	1	1	1	1	1	-	-
F47	1	0	0	0	1	0	1	1	-	-
F48	0	0	0	0	0	0	0	0	-	-
F49	1	1	1	0	1	1	1	1	-	-
F50	0	0	0	0	0	0	0	0	-	-
F51	1	1	1	1	1	1	1	1	-	-
F52	1	1	0	0	1	1	1	1	-	-
F53	0	0	0	0	1	1	1	1	-	-
F54	U	U	0	0	1	1	1	1	-	-

continues

F55	1	1	0	0	1	1	1	1	-	-
F56	1	0	0	0	1	1	1	1	-	-
F57	0	0	0	0	0	0	1	1	-	-
F58	1	1	1	1	1	1	1	1	-	-
F59	1	1	1	1	1	1	1	1	-	-
F60	1	1	1	1	1	1	1	1	-	-
F61	1	1	1	1	1	1	1	1	-	-
F62	U	U	0	1	1	1	1	1	-	-
F63	0	0	0	0	1	0	1	1	-	-
F64	1	1	1	1	1	1	1	1	-	-
F65	1	1	0	0	1	1	1	1	-	-
F66	U	0	0	0	1	0	1	1	-	-
F67	U	U	0	0	1	1	1	1	-	-
F68	1	1	1	1	1	1	1	1	-	-
F69	1	1	0	0	1	1	1	1	-	-
F70	0	1	0	0	1	1	1	1	-	-
F71	U	U	0	0	0	0	1	1	-	-
F72	1	1	0	1	1	1	1	1	-	-
F73	1	1	1	0	1	1	1	1	-	-
F74	1	1	1	1	1	1	1	1	-	-
F75	1	1	1	1	1	1	1	1	-	-
F76	1	1	1	1	1	1	1	1	-	-
F77	U	U	1	1	0	0	1	0	-	-
F78	U	U	1	1	0	1	1	1	-	-
F79	U	0	0	0	1	1	1	1	-	-
F80	0	U	0	1	1	1	1	1	-	-
F81	U	U	0	0	0	1	0	1	-	-
F82	1	1	1	1	1	1	1	1	-	-
F83	U	U	1	0	0	1	1	1	-	-
F84	1	1	1	1	1	1	1	1	-	-
F85	1	1	0	1	1	1	1	1	-	-

continues

F86	1	1	1	1	1	1	1	1	-	-
F87	U	1	0	0	1	1	1	1	-	-
F88	1	U	0	0	1	0	1	0	C	D
F89	1	1	0	0	1	1	1	1	D	C
F90	1	U	0	0	1	1	1	1	C	D
F91	1	U	1	0	1	0	1	1	D	D
F92	1	1	1	1	1	1	1	1	D	D
F93	1	1	1	0	1	1	1	1	D	D
F94	1	1	0	1	1	1	1	1	A	A
F95	1	1	1	1	1	1	1	1	A	A
F96	U	U	1	1	0	0	1	1	A	A
F97	1	1	1	1	1	1	1	1	D	D
F98	1	1	1	0	1	1	1	1	D	D
F99	1	0	0	0	1	0	1	0	C	D
F100	1	0	1	0	1	1	1	1	A	D
F101	1	1	1	1	1	1	1	1	C	C
F102	1	1	1	1	1	1	1	1	D	A
F103	1	1	0	1	1	1	1	1	C	C
F104	1	1	1	1	1	1	1	1	D	D
F105	1	1	1	1	1	1	1	1	D	D
F106	U	0	1	1	1	1	1	1	A	A
F107	1	1	1	1	1	1	1	1	A	A
F108	U	1	1	1	1	1	1	1	A	D
F109	1	1	1	1	1	1	1	1	A	A

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