Evaluating the effect of IFRS adoption on earnings management in Greece. A logit approach

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Abstract: The study examines if IFRS adoption resulted in the long run to decreasing accounting manipulation. We use the full sample of 231 non-financial firms that were listed on the ASE between 2002 and 2015, to examine our hypothesis. We measure the accounting quality in financial statements of Greece by using five different methods. We provide for the first time evidence based on the long-term period that supports the hypothesis that IFRS adoption has been a significant step towards transparency and lower information costs. The findings of study endorse the wider and faster adoption of international accounting standards, and provide a valuable evidence globally that can be useful to regulators and market participants.

Keywords: accounting quality; International Financial Reporting Standards; IFRS; earnings management; earnings manipulation; logit; Greece; auditing.

1. Introduction

Financial reporting's objective is providing information related to financial positions, the changes and performance in and of the financial position of an entity that would be useful in economic decision-making for variegated users, such as employees, investors, lenders, customers, suppliers, the general public and the government. Financial reporting's quality has received increased attention, especially after the recent accounting scandals. Despite the increased awareness, the term 'accounting quality' is vague and ambiguous to define. The objective of the IFRS is developing, in the interest of the public, a single set of accounting standards of high quality which need comparable and transparent information provided in financial statements. This paper investigates whether the application of the International Financial Reporting Standards (IFRS) is associated with higher accounting quality. The firms that are listed in Greece applied local standards (GAAP) until 2005 while adopted the IFRS in consolidated from 2005 onwards. The contribution of the study is two-fold. First, the study to the best of our knowledge is the first of its kind that examines the effect of IFRS adoption during a long period that includes the recent financial crisis. Indeed whilst previous studies attempted to examine the effect of IFRS on accounting reporting quality (see Iatridis and Rouvolis, 2010; Iatridis and Dalla, 2011; Tsipouridou and Spathis, 2012; Dimitropoulos et al., 2013; Papadamou and Tzivinikos, 2013)[1] their sample is terms of number of companies or period examining is limited[2], something that constrains the ability of past studies to draw robust conclusions.[3] Regarding the long-term effect of IFRS. Second, our study is the first of its kind, in Greece, that takes account of endogeneity, which is a significant methodological aspect not examined nor treated in early studies that can invalidate past findings.

   The study uses hand-picked data for the Athens stock exchange, Greece, during a recent and volatile period, and to examine if IFRS and firm-specific factors, like the selection of large auditing firms or company size lead to less earning manipulation. For that purpose, we built a two-stage logit model. We found that IFRS, as well as large company size and the selection of large auditing firms, led to a significant decrease in earnings manipulation. These findings will have significant policy impact on the governments of the ten new EU member states and will enrich the literature of academicians on that specific topic.

The paper has the following structure: Section 2 reviews the existing literature on the subject. Section 3 describes the hypothesis testing, Section 4 the methodology and the data. Section 4 presents and analyses the results and finally Section 5 contains empirical findings and Section 6 the conclusion.

2. Literature review

The utilisation of creative accounting practices inside a company might be attributed to the diverse interests of the shareholders (principals) and managers (agents) in accordance with agency theory. This problem started in the 1920s but received more attention during the 1980s, in general, and the 1990s, in particular, due to a series of bankruptcies like in the case of Enron.

It has been argued (Ashbaugh and Pincus, 2001) that limiting the flexibility of accounting techniques can improve accounting quality. A rational expectations model that depicts that the accounting standards that restrict opportunistic discretion lead to accounting earnings that reflect to a larger extent firm's underlying economics and which, therefore, are of higher quality was developed by Ewert and Wagenhofer (2005). Moreover, accounting quality can be improved in case the changes in the financial reporting system are contemporaneous with the firms' adoption of the IAS (e.g., more rigorous enforcement). According to Breeden (1993), this flexibility acted as a concern for market regulators at the international level for a long time. Also, even if the IAS/IFRS provides higher quality standards, the effects of the financial reporting system's features, in addition to the standards themselves, could eliminate any improvement in accounting quality that arises from the adoption of the IAS/IFRS. It was suggested by Cairns (1999), Street and Gray (2001), Ball et al. (2003) and Burgstahler et al. (2006) that lax enforcement can lead to limited compliance with the standards and, consequently, limit their effectiveness.

This discussion has become even more relevant, as the results presented in the literature on IFRS adoption and earnings management are not unanimous. In certain instances, companies tend to manage their earnings at a high level. However, other companies do not manage their earnings.

The designation of IFRS begins in 1975, when IASC, which was established in 1973, published the first IAS. Since 1973, the process for setting IAS has undergone substantial evolution. Adoption, however, of IFRS is not a complete solution. Despite the adoption of IAS/IFRS, it was noted by Cairns (1999) and Street and Gray (2001) that many firms are not in compliance with the IAS/IFRS even though they have

adopted it. Ball et al. (2003) examined firms in Hong Kong, Malaysia, Singapore and Thailand for timely loss recognition. They found that the rapid loss recognition for the firms these countries are no better than that in the firms of code law countries. In another survey, Burgstahler et al. (2006) found that there is fewer earnings management in case there is a robust legal system. In the same study, they found that different incentives created by market pressures and institutional factors lead to the reporting of earnings, thereby reflecting economic performance. Soderstrom and Sun (2007) analysed the literature on the consequences of changes in the accounting standards (IFRS adoption).

Consequently, they found that accounting quality's determinants after these standards' adoption can be articulated in the form of the following three factors: quality of the standards, political and judicial system of the country and financial reporting incentives. Chen et al. (2010) adopted the assumption that the relationship that is established between accounting quality and IFRS adoption is not restricted to the economic consequences' perspective. Chand et al. (2008) and Guerreiro et al. (2008) posited that the accounting system in each country is a cultural, economic, historical and political product that is incorporated into their beliefs and influenced by the way in which each country interprets and adopts the IFRS standards.

It was stated by Leuz et al. (2003) that "outsider economies with relatively dispersed ownership, strong investor protection, and large stock markets exhibit lower levels of earnings management than insider countries with relatively concentrated ownership, weak investor protection, and less developed stock markets." They classified Greece (along with Austria) as the countries that depict the highest earnings management. It was found by Ding et al. (2007) that 'absence' facilitates opportunities for earnings management. Taking into consideration that Greece has a very high 'absence' score, the findings of the study that was conducted by Leuz et al. (2003) are not surprising.

Practices related to creative accounting were expected to be curtailed with the IFRS' introduction. Greek GAAP allowed start-up costs' recognition as intangible assets. This is consistent with creative accounting's definition that is used herein. Therefore, it can be perceived that the Greek companies progressed with start-up costs' excessive capitalisation. Besides, no clear distinction has been made between development and research expenses. In a similar manner to the excessive capitalisation of start-up costs, companies even capitalised the research expenditures. This is relevant in the Greek context when one considers that high values of assets affect debt covenants and that

banks are the main providers of finance (Tzovas, 2006). In addition, by non-expensing the research expenditure as well as the start-up costs, companies did not reduce their profits. The latter demonstrated that credit finance is the most important motive for companies to overstate their profits. These research expenses and start-up costs do not meet the recognition criteria of IAS 38, the adoption of which was accordingly expected to affect shareholders' equity negatively. The Greek accounting framework differed substantially from the IFRS and had been characterised as stakeholder-oriented, taxdriven (Spathis and Georgakopoulou, 2006) and conservative. According to Ding et al. (2007), Greece is the country (out of 30 countries) with the highest number of issues lacking from the local GAAP, which is covered by the IAS ('absence score'). Furthermore, Greece is the 10th most 'diverged' country (out of 28) in relation to the differences between the IAS and national rules (Ding et al., 2007; Spathis and Georgakopoulou, 2006).

According to Ding et al. (2005), 'divergence' is closely related to culture, and Greece has a distinct culture. Also, Ding et al. (2007) identified a positive association between ownership concentration and 'absence'. Ownership concentration is a specific feature of the Greek market. Moreover, Ding et al. (2007) found a negative association between the importance of the equity market, which is low in Greece, and 'divergence'.

IAS/IFRS adoption in Greece limited flexibilities. IAS 19 requires the recognition of the defined-benefit liabilities. In addition, the Greek GAAP allowed considerable subjectivity for recognising provisions, while IAS 37 has more explicit requirements for the recognition of provisions. Thus, it was expected to impact the net assets negatively. The same applies to the adoption of IAS 39, which establishes specific requirements for the measurement of receivables and loans. The requirements of IAS 32 for the deduction of own shares from the shareholders' equity were expected to reduce net assets. IAS 36 also explicitly requires companies to 'assess at each reporting date whether there is any indication that an asset may be impaired. Finally, IAS 2 does not permit the use of last in, first out (LIFO) method to measure the cost of inventories.

This paper contributes to the literature by exploring whether higher quality financial reporting is associated with the adoption of the IFRS. Specifically, the research question addresses whether the quality of earnings reported in Greek financial statements has been affected by the adoption of the IFRS. In addition, the scope of the question is expanded to include whether high-quality financial reporting is associated with the adoption of IFRS.

It was argued (see Nobes, 2006; Iatridis, 2010) that pre-IFRS differences will affect the starting point of IFRS' financial statements. As the Greek GAAP is significantly different from the IFRS, it was

expected that the financial statements of Greek companies also, especially book value, would be considerably affected by the transition to the new accounting regime.

3. Hypothesis testing

We applied accounting quality using earnings management, and timely loss recognition and value relevance metrics following prior research. We examined two manners of earnings management. The first manner comprises earnings smoothing, and the second manner entails the management of positive earnings. We expected that the earnings based on the IAS/IFRS would be less managed than the Greek GAAP, as the IAS/IFRS limits the management's discretion to report the earnings that are less reflective of the firm's economic performance. According to the studies conducted by Lang et al. (2003), Leuz et al. (2003), Ball and Shivakumar (2005, 2006) and Lang et al. (2006), we can assume that firms with fewer earnings smoothing exhibit more earnings variability. Thus we expect (H1) that firms applying the IAS/IFRS will exhibit more variable earnings than those that apply the Greek GAAP. Our expectation is supported by several studies.

Leuz et al. (2003) found that earnings smoothing is less pronounced in common law countries. The conceptual framework of the IAS/IFRS is similar to those of common law countries. Ewert and Wagenhofer (2005) showed that the application of accounting standards limits the management's discretion and that this results in higher variability in accounting earnings. In addition, Ball and Shivakumar (2005, 2006) suggested that the timely recognition of profit and loss, which is consistent with higher earnings quality, tends to increase the volatility of earnings in relation to cash flows. We used two metrics of earnings variability to examine our expectation. The first metric comprises the variability of change in net income, whereas the second metric is the changing variability in net income in relation to the changing variability with respect to cash flow.

We also expected (H2) that the application of the IAS/IFRS would result in firms having fewer earnings management and, consequently, higher earnings variability. Healy (1985) suggested managers might utilise discretion in certain ways that would produce higher earnings variability in the case of 'big baths'. Therefore, the firms that applied domestic standards could demonstrate more discretion for this form of earnings management, thereby resulting in higher earnings variability. Moreover, lower earnings quality could indicate higher earnings

variability due to the errors that are made in estimating accruals. Concluding higher quality accounting can result in lower earnings variability.

In addition, the studies conducted by Lang et al. (2003), Leuz et al. (2003), Ball and Shivakumar (2005, 2006) and Lang et al. (2006) interpreted a more negative correlation as an indicator of earnings smoothing, as managers respond to poor cash flow outcomes by increasing accruals. Therefore, it can be assumed that the firms that have more earnings smoothing present a more negative correlation between cash flows and accruals. It was shown by Ball and Shivakumar (2005, 2006) that timely profit and loss recognition, which are consistent with higher earnings quality, attenuate the negative correlation between the cash flow and accruals during the current period. Therefore, we can predict (H3) that firms that apply the IAS/IFRS will present a less negative correlation between cash flows and accruals than those that apply national standards.[4]

Prior research used small positive net income as a metric for providing evidence of managing towards securing positive earnings (Burgstahler and Dichev, 1997; Leuz et al., 2003). This metric expresses that the management prefers reporting small positive net income rather than negative net income. Therefore, we hypothesise in our study (H4) that the firms that apply the IAS/IFRS will report small positive net income with a lower frequency in comparison to those that apply domestic standards.

We expected that higher quality earnings would exhibit a higher frequency of large losses with respect to timely loss recognition. Ball et al. (2000), Lang et al. (2003), Leuz et al. (2003), Ball and Shivakumar (2005, 2006) and Lang et al. (2006) interpreted a more negative correlation as an indicator of earnings smoothing, as managers respond to poor cash flow outcomes by increasing accruals.

Finally, although we predicted that higher quality accounting leads to a higher frequency of larger losses, the opposite could also be true. Large losses with a higher frequency can be indicative of big bath earnings management. Moreover, large losses with a higher frequency can be a result of errors in the act of estimating accruals. Therefore, higher quality accounting can lead to a lower frequency of large losses.

4. Methodology and data

Our sample contains data from 231 firms that were listed on the ASE between 2002 and 2015. We analysed the number of firms per sector in the following table after excluding the firms involved in banking, utilities and financial services from the sample.

Table 1 Percent of examined firms per sector

Sector	Number of observations (without missing values and outliers)	Percentage
Industrial goods and services	249	10.08
Retail	130	5.27
Construction and materials	334	13.52
Media	137	5.54
Oil and gas	39	1.58
Personal and household goods	462	18.71
Travel and leisure	139	5.63
Technology	273	11.05
Telecommunications	5	0.20
Food and beverage	300	12.15
Health care	107	4.33
Chemicals	109	4.41
Basic resources	186	7.53
Total	*2,470*	*100.00*

We considered the period between 2002 and 2004 as the Greek GAAP adoption period and that from 2005 to 2015 as the IFRS adoption period. As our sample included only Greek data, we did not use a matching sample procedure as in the study conducted by Barth et al. (2005).

We used four earnings management metrics – three for earnings smoothing and one for managing earnings towards achieving a target – by following the literature. Our first measure for earnings smoothing is based on the variability of the change in net income scaled by total assets (Barth et al., 2005; Lang et al., 2006; Leuz et al., 2003). We considered the higher variance in the net income change as evidence of earnings smoothing occurring at a lower level. Changes in net income are likely to be sensitive to a variety of factors that are un-attributable to the financial reporting system, such as the economic environment and incentives to adopt the IAS/IFRS. Thus, following the study conducted by Lang et al. (2006), our earnings variability metric is regarded as the residuals' variance from the change regression in net income (ΔNI) on the variables that were identified in prior research to act as controls for these factors (Ashbaugh and Pincus, 2001; Lang et al., 2003, 2006; Pagano et al., 2002; Tarca, 2004), ΔNI.

$$\Delta NI_{it} = +\alpha\,\alpha_{01}SIZE_{it} +\alpha_2 GROWTH_{it} +\alpha_3 LEV_{it} +\alpha_4 DISSUE_{it}+\alpha_5 TURN_{it} +\alpha\,\alpha_6 CF_{it} + {}_7 AUD_{it} +\varepsilon_{it}$$

(1)

where

SIZE the natural logarithm of the end-of-year market value of equity

GROWTH percentage change in sales

LEV end-of-year total liabilities divided by end-of-year equity book value

TURN sales divided by end-of-year total assets

DISSUE percentage change in total liabilities

CF annual net cash flow produced by operating activities

AUD an indicator variable that equals 1 if the firm's auditor is PwC, KPMG-Deloitte, Grant Thornton, E&Y, and 0 otherwise.

Our second earnings smoothing metric is based on the mean ratio of the variability of the change in net income, that is, ΔNI, to the variability of the change in operating cash flows, namely, ΔC. In case accruals are used by firms in order to manage their earnings, the change variability in the net income would be lower than the same in the operating cash flows. The firms that exhibit cash flows that are more volatile typically have net income that is more volatile. Therefore, our second metric tries to act as a control for this. Just like ΔNI, ΔCF has the potential to be sensitive towards variegated factors that cannot be attributed to the financial reporting system. Consequently, the following equation (2) was also estimated by us with ΔCF as the dependent variable:

$$\Delta CF_{it} = +\alpha\,\alpha_0\quad{}_1 SIZE_{it} +\alpha_2 GROWTH_{it} +\alpha_3 LEV_{it} +\alpha_4 DISSUE_{it}+\alpha_5 TURN_{it} +\alpha\,\alpha_6 CF_{it} + {}_7 AUD_{it} +\varepsilon_{it}$$

(2)

Our third earnings smoothing metric is based on the Spearman correlation between accruals and cash flows. As we can assume, equations (1) and (2) are variability metrics using which we can compare the correlations of residuals from equations (3) and (4), CF and ACC, rather than comparing the correlations between CF and ACC directly. As with the equations (1) and (2), both CF and ACC are regressed on the control variables, but excluding CF, the following can be obtained:

$$CF_{it} = +\alpha\,\alpha_{01}SIZE_{it} +\alpha_2 GROWTH_{it} +\alpha_3 LEV_{it} +\alpha_4 DISSUE_{it}+\alpha_5 TURN_{it} +\alpha_6 AUD_{it} +\varepsilon_{it}$$

(3)

$$ACC_{it} = +\alpha\,\alpha_{01}SIZE_{it} +\alpha_2 GROWTH_{it} +\alpha_3 LEV_{it} +\alpha_4 DISSUE_{it}+\alpha_5 TURN_{it} +\alpha_6 AUD_{it} +\varepsilon_{it}$$

(4)

We measure timely loss recognition as the coefficient on large negative net income (LNEG), in the regressions that are given by equation (5) (Lang et al., 2003, 2006). When comparing IAS and non-international accounting standards (NIAS) firms in the post-adoption (pre-adoption) period, we estimated equation (5) by pooling observations from the post-adoption (pre-adoption) period as follows:

$$IAS(0,1)_{it} = +\alpha \; \alpha_0 \;{}_1LNEG_{it} +\alpha_2 SIZE_{it} +\alpha_3 GROWTH_{it} +\alpha_4 LEV_{it} +\alpha_5 DISSUE_{it} +\alpha_6 TURN_{it}$$
$$+\alpha \; \alpha_7 CF_{it} + {}_8 AUD_{it} +\varepsilon_{it} (5)$$

where *LNEG* = an indicator variable that equals 1 for observations for which annual net income that is scaled by the total assets is less than – 0.20, and 0 otherwise. A positive coefficient on *LNEG* indicates that IAS firms recognise large losses more frequently than NIAS firms. We use the coefficient on *LNEG* from equation (5) rather than directly comparing IAS and NIAS firms' frequencies of large losses to assess whether IAS firms are less likely to manage earnings.

Finally, we tested whether companies manage their earnings towards achieving small positive earnings (Barth et al., 2005; Burgstahler and Dichev, 1997; Leuz et al., 2003). The coefficient on the small positive net income SPOS in the regression is given by equation (5). When comparing IAS and NIAS firms in the post-adoption (pre-adoption) period, we estimated pooling observations from the post-adoption (pre-adoption) period, as given in equation (6).

$$IAS(0,1)_{it} = +\alpha \; \alpha_0 \;{}_1SPOS_{it} +\alpha_2 SIZE_{it} +\alpha_3 GROWTH_{it} +\alpha_4 LEV_{it} +\alpha_5 DISSUE_{it} +\alpha_6 TURN_{it}$$
$$+\alpha \; \alpha_7 CF_{it} + {}_8 AUD_{it} +\varepsilon_{it}$$

(6)

where is *IAS*(0,1) = an indicator variable that equals 1 for IAS firms and 0 for NIAS firms, and *SPOS* = an indicator variable that equals 1 if the net income scaled by total assets is between 0 and 0.01 (Lang et al., 2003). A negative coefficient on *SPOS* indicates that NIAS firms manage earnings towards small positive amounts more frequently than IAS firms do.

We based our inferences on the coefficient on SPOS from equation (6) instead of comparing directly the percentages of small positive income of IAS and NIAS firms, as the *SPOS* coefficient reflects the controls' effects for the factors that can be attributed to the financial reporting system.

5. Empirical findings

Our research question entailed the comparison of the accounting quality (earnings quality and timely loss recognition) of the firms listed in Greece before and after the adoption of the IAS/IFRS.

The sample was initially tested for multicollinearity, heteroscedasticity and endogeneity. To eliminate the probability that one or more of the independent variables included in the model correlate with one another, a mutlicollinearity test was conducted. According to Gujarati and Porter (2003), in case the independent variables are correlated, it is not possible to correctly estimate the variables' beta coefficients. The presence of multicollinearity makes it difficult to identify the separate effects of the independent variables. Consequently, some of the variables may be dropped, as the model cannot isolate the effect that each independent variable may have on the dependent variable. A method of testing for multicollinearity comprises the utilisation of the variance inflation factor (VIF). In case two of the independent variables are correlated, then there is collinearity in the model. The VIF reveals the degree to which every independent variable could be explained by the other independent variables in the model. According to Gujarati and Porter (2003), the VIF should have a value less than or equal to 10 for no multicollinearity to be present among the variables. As can be perceived after our calculation, no multicollinearity was there in the sample, as all the VIF values were below the critical value of 10. In addition, heteroscedasticity was checked with the Breusch-Pagan test.

Finally, the sample was checked for endogeneity. We followed three steps to check the endogeneity. First, we performed tests of endogeneity. The null hypothesis has variables that are exogenous (H0: variables are exogenous). We rejected the null hypothesis if the p-value was low. Second, we reported the first-stage regression to check whether the instruments are weak. We used the Partial R-square to check whether there is a correlation between the instruments and endogenous variables. We rejected the null hypothesis if the F-statistic is largest from the critical value. The final step to check the endogeneity entails performing tests for over identifying restriction with Sargan and Basmann tests. The null hypothesis established the validity of the instruments and mentioned that the model is correctly specified. Therefore, it can be concluded that the sample does not demonstrate endogeneity.

First, we investigated whether the earnings quality increased with the adoption of the IAS/IFRS. Thus, our first prediction was related to earnings smoothing. As Greece is a code-law country, we expected that earnings smoothing was more pronounced when firms adopted national standards than when firms adopted the IAS/IFRS. Leuz et al. (2003)

found that earnings smoothing is more pronounced in non-common law countries. This led to test the hypothesis (H1) that there was no significant difference before and after the adoption of IAS/IFRS.

Our first metric associated with the prediction is related to earnings quality. We predicted that earnings smoothing is more pronounced before than after the IAS/IFRS standard adoption. To check our hypothesis, we compared the variability of the change in net income residuals scaled by total assets (Barth et al., 2005; Lang et al., 2006; Leuz et al., 2003) before and after the adoption of the IAS/IFRS. The results are presented in Table 2.

Table 2 Variability of net income residuals

	Greek GAAP firms	IAS/IFRS firms
Variability	0.320	0.9777
No. observations	390	1,406

The results from Table 2 showed that the firms that adopted the IAS/IFRS exhibit significantly higher variability in the change in net income residuals. The variability is 0.320 with domestic standards versus 0.9777 with the IAS/IFRS standard. This result seems to suggest that firms reported less smooth earnings during the period when they adopted IAS/IFRS standards than when they adopted domestic accounting standards.

Our second earnings smoothing metric is based on the mean ratio of the variability of the change in net income residuals to the variability of the change in operating cash flow. We estimated this variability from equation (2). The results are presented in Table 3.

Table 3 Variability of net income residuals and cash flows from operations

	Greek GAAP firms	IAS/IFRS firms
Variability	191.861	396.714
No. observations	390	1,406

Table 3 shows that the ratio of the variance of change in net income to the variance in the change of cash flows from operations is higher in the period of IAS/IFRS adoption than in the period when the Greek GAAP was adopted. This finding is consistent with the fact that the adoption of the IAS/IFRS standards leads to a less smooth net income,

as the variability is not only due to the variability in cash flows from operations.

Our third earnings smoothing metric is based on the Spearman correlation between accruals and cash flows [equations (3) and (4)]. Table 4 shows the results of the Spearman correlation before and after the adoption of the IAS/IFRS with respect to accruals and cash flow.

Table 4 Spearman correlation between accruals and cash flows before the adoption of the IAS/IFRS

			Panel A: correlations before IFRS adoption				
CF/ACC	*SIZE*	*GROWTH*	*LEV*	*DISSUE*	*TURN*	*AUD*	*SECTOR*
CF	0.5771	0.28217	0.015958	–0.15307	0.141103	–0.00126	0.021335
ACC	0.013339	0.107033	0.045353	–0.09678	0.129744	0.172546	–0.00771
			Panel B: correlations after IFRS adoption				
CF/ACC	*SIZE*	*GROWTH*	*LEV*	*DISSUE*	*TURN*	*AUD*	*SECTOR*
CF	0.550377	0.406127	0.147023	–0.25716	0.273088	0.212309	–0.06095
ACC	0.150094	0.125016	–0.09255	0.156298	0.183709	–0.06339	0.035595

The last metric for managing earnings was computed with equations (5) and (6).

We measure timely loss recognition as the coefficient on LNEG residuals, LNEG, in the regressions given by equation (5) and estimated the logit model to estimate the coefficients of LNEG. Our results are illustrated on Table 5.

The coefficient of LNEG is positive and statistically significant. A positive coefficient on LNEG indicates that the IAS/IFRS firms recognise large losses more frequently in the post-adoption period than they do in the pre-adoption period. In this equation, the R^2 is 0.2077 and is relatively low, but we can interpret this fact, as the values of our sample are low. Moreover, variables of size, dissue (percentage change in total liabilities), cash flow (CF) and audit (AUD), as given in the previous equation, are statistically significant according to the p-value. In addition, the sample was tested for multicollinearity, heteroscedasticity and endogeneity. Finally, multicollinearity was checked with VIF, heteroscedasticity was checked with Breusch-Pagan test and endogeneity was checked, as described above, and found that the sample does not have multicollinearity, nor the model does not suffer from endogeneity.

Table 5 Logit model for variable LNEG

	Coef.	Std err.	z	P > |z|	[0.025]	[0.975]
SIZE	−1.2298	0.120	−10.280	0.000	−1.464	−0.995
GROWTH	0.0596	0.084	0.710	0.478	−0.105	0.224
LEV	−0.0007	0.004	−0.176	0.860	−0.009	0.007
DISSUE	−0.8065	0.078	−10.299	0.000	−0.960	−0.653
TURN	−0.1087	0.085	−1.286	0.198	−0.274	0.057
CF	1.261e-08	3.94e-09	3.199	0.001	4.88e-09	2.03e-08
AUD	0.7726	0.161	4.795	0.000	0.457	1.088
LNEG	1.521	0.417	3.645	0.000	0.703	2.339
SECTOR	0.028	0.018	1.552	0.121	-0.007	0.064
CONST	9.2914	0.868	10.704	0.000	7.590	10.993
No observations	1,800					
Df residuals	1,790					
Pseudo R-squ.	0.2077					
Log-likelihood	−745.38					
LL-null	−940.78					

We also examine whether companies manage earnings towards small positive earnings deviations. The coefficient on small positive net income SPOS in the regression is given by equation (6). We estimated the logit model to estimate the coefficients of SPOS. Our results are illustrated on Table 6.

Table 6 Logit model for variable SPOS

	Coef.	Std err.	z	P > |z|	[0.025]	[0.975]
SIZE	−1.3021	0.119	−10.963	0.000	−1.535	−1.069
GROWTH	0.037	0.078	0.474	0.635	−0.116	0.19
LEV	−3.74E-05	0.004	−0.008	0.993	−0.009	0.009
DISSUE	−0.7985	0.077	−10.407	0.000	−0.949	−0.648
TURN	−0.1076	0.083	−1.304	0.192	−0.269	0.054
CF	1.21E-08	3.87E-09	3.124	0.002	4.50E-09	1.97E-08
AUD	0.7682	0.161	4.772	0.000	0.453	1.084
SPOS	−0.5161	0.153	−3.37	0.001	−0.816	−0.216
SECTOR	0.0322	0.018	1.768	0.077	−0.003	0.068
CONST	9.9937	0.862	11.588	0.000	8.303	11.684
No observations	1,801					
Df residuals	1,791					
Pseudo R-squ.	0.2037					
Log-likelihood	−749.35					
LL-null	−941.03					

The coefficient of SPOS is negative and statistically significant. SPOS has a negative coefficient, which indicates that NIAS firms manage earnings towards small positive amounts more frequently than accounting standard (IAS) firms. The R^2 is 0.2037, that is in line with similar studies. In addition, variables of size, dissue (percentage change in total liabilities), CF and audit (AUD) are statistically significant according to the p-value.

The importance of variables of size, dissue and CF are in line with findings from other studies. According to De Angelo (1981), the size of the audit firm is an important criterion for undertaking quality control. Our findings also support the findings of Balvers et al. (1988), Beatty (1989), Craswell et al. (1995), DeFond et al. (2000), Gaganis and Pasiouras (2006), Ireland and Lennox (2002), Keasey et al. (1988), Menon and Williams (1991) and Pong and Whittington (1994), according to the argument of

De Angelo referred that the bigger sized audit firms (such as Pricewaterhouse Coopers, Deloitte, KPMG and Ernst and Young) with international reputation provide reports that demonstrate higher degree of precision and record indications, such as financial failure (Lennox, 1999; Petroni and Beasley, 1996) and disputes (Palmrose, 1998). As a consequence, the more prominent audit firms find it more challenging to recede from the pressure of the firms (Krishnan and Schauer, 2000), as they want to protect their reputation. Moreover, they have more experience in different sectors of firms and, furthermore, they can have access to more data (Benston, 1985).

Regarding size, our results confirm Titman and Trueman (1986) and Datar et al. (1991) that referred that the welfare firms prefer to be controlled by bigger audit firms, as they demonstrate more effective audit control. The studies conducted by Deis and Giroux (1992) and Colbert and Murray (1998) mentioned that there is a strong correlation between the size of the audit firm and its control quality.

6. Conclusions

The study fills a significant research gap, as it is the first of its kind that considered data on all listed in the Athens Stock Exchange non-financial firms, for an extending period from 2002 to 2015, to investigate if IFRS and firm specific factors resulted in smaller earnings manipulation and loss recognition.

We used a two-stage logit model and our models also found free from multicolinearity and endogeneity. Our results provide a unique and robust evidence that IFRS resulted in a significant decrease in earning manipulation policies. The study therefore supports the hypothesis that Greek firms that applied the IAS/IFRS exhibited less earning smoothing, less managing of earnings towards achieving a target and more timely recognition of losses, extending early findings from Iatridis and Rouvolis (2010) and Tsipouridou and Spathis (2012). We confirm Healy (1985), Ewert and Wagenhofer (2005) and Ball and Shivakumar (2005, 2006), that argue that the significance of accounting standards and timely recognition to limit the management's discretion and volatility of earnings.

We took into account the interaction of features of the financial reporting system, which include accounting standards and their interpretation, enforcement and litigation. We also found that large companies and the selection of large auditing companies lead to smaller accounting manipulation, extending the findings of Tsipouridou and Stathis (2012) and Iatridis (2010) in the Greek market and UK markets, respectively and confirming the 'reputation theory' in Krishnan and Schauer (2000).

Overall, our findings, provide for the first time evidence based on the long-term period that includes expansion and recession periods, that supports the hypothesis that IFRS adoption has been a significant step towards transparency and lower information costs. Given the unprecedented variation of macroeconomic conditions during the period examined in the Greek market, our study provides a valuable evidence globally. These results provide evidence that is useful to

regulators, analysts and investors. Regulators and investors should pursue wider and faster adoption of international accounting standards as it is beneficial for investors and promotes efficient capital allocation.

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Notes

1   Papadamou and Tzivinikos (2013) examine the effect of IFRS adoption in the Greek banking sector only, during the pre-crisis period 2000 to 2009.

2   Iatridis and Dalla (2011) use 200 companies during the 2-year period 2004–2005, Iatridis and Rouvolis (2010) use the period 2004–2006 and Tsipouridou and Stathis (2012) that examined audit selection and IFRS used the period 2005 to 2009 and Dimitropoulos et al. (2013) uses only a sample of 101 companies during the pre-crisis period 2001–2008.

3   On the contrary, other studies (e.g., Zeghal et al., 2013) that examine the effect of IFRS in other markets have extended period and sample.

4   Although we predicted that higher quality accounting results in a less negative correlation between cash flow and accruals, the opposite can be true. Dechow (1994) suggested that accruals and cash flows are expected to be negatively correlated, as the proper role that accruals play in income measurement is to smooth variability in cash flows, as accruals can reverse over time. Thus, the firms that apply domestic standards can manage earnings to exhibit a less negative correlation between accruals and cash flows. In addition, a less negative correlation between accruals and cash flows can be indicative of lower accounting quality due to the errors that are made in estimating accruals. Thus, a more negative correlation between accruals and cash flows can result in higher quality accounting.

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