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Deferred Tax Positions under the prism of financial crisis and the effects of a corporate tax reform

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ABSTRACT

The effects of corporate tax reforms in reported profits and firms' financial position have been extensively studied in the literature. However, only few studies disaggregate deferred tax items to jointly explore political implications and aspects of corporate behavior around such reforms. Greece's recent financial crisis and economic recession provides an intriguing setting for examining possible incentives and consequences of substantial tax rate changes, such as the 6% increase imposed by the Greek Government early in year 2013. Results reveal a totally different picture between financial and non-financial firms, with the former being clearly favored, at least from this short-run effect. More specifically, Greek banks, given the very significant Deferred Tax Assets Positions arising from the "haircut" of Greek Government Bonds known as PSI, strengthen their assets and net income by 1.58 billion Euros, corresponding to more than $\frac{1}{4}$ of their total losses at the end of 2012, whereas industrial firms experience a significant increase in long-term liabilities and a decrease in net income of 193%. These findings seem to coincide with the view that tax policy design is usually shaped by taking into consideration powerful groups' interests, as it normally happens with banks especially in periods of fiscal instability.

Keywords: *International Financial Reporting Standards, deferred tax, book-tax differences, tax policy*
JEL classification: M41, H25

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1. Introduction

Up to date research in the field of financial corporate taxation does not seem to take into account sufficiently the principles and rules of International Accounting Standards/International Financial Reporting Standards (IAS/IFRS, US GAAP), which connect future tax liabilities and payments to reported earnings and financial structure (Poterba et al., 2010). Researchers in the field of accounting highlight and recognize the potential impact of accounting rules on disclosure of profit and market valuation of firms, but little reference is made to political choices related to firm tax planning and the public tax policy exercised. The divergence of Book earnings from the Tax earnings and its correlation with maintainability and more generally the quality of corporate profits has attracted the interest of several researchers (Chen et al., 2012; Desai, 2005; Hanlon and Shevlin, 2005; Ready, 2011).

According to the Greek Accounting Framework¹, the Tax burden in Financial Statement for a period is based on the taxable and deductible amounts that will be shown on the tax return for the current year (Current Tax). This doesn't affect the profit and loss Statement and is reported briefly through the profit and loss distribution Statement. This picture changes radically for the firms listed in the Athens Stock Exchange (ASE) that complies with the mandatory adoption of IAS/IFRS². According to IFRS Current and Deferred Tax should mainly be recognised as income or expense and included in profit or loss for the period in a transparent and internationally comparable manner, thus disengaging the latter from national taxation requirements and restraints.

This paper aims to illustrate the meaning and function of deferred taxation and to highlight the role and importance of *Deferred Tax Positions* (DTPs) in Financial Statements, focusing not only on the size or changes but identifying and categorizing their causes³. Additionally, we will assess the impact of changes to the business environment related to deferred taxes (DT), as in the case of changing corporate tax rates.

Deferred Tax Positions incorporate the estimated future tax effects and seek to bridge the gap between *Reported Income* and *Taxable Income*⁴. The latter arise mainly from the different laws and regulations in the calculation of book and tax income and are due to "*Temporary Differences*" between book and tax value (basis) of Assets and Liabilities. The Generally Accepted Accounting Principles (GAAP) require firms to revalue the items of Deferred Taxes (DT) on their statement of financial position in every case of changes in tax rates or changes in tax laws. DTs are calculated on temporary differences between book and tax value of Assets and Liabilities, multiplied by the institutionalized (or expected) tax rate. Thus a change of the tax rate brings a corresponding decrease or increase in the value of DT in the Statement of Financial Position. The revaluation gap more often than not affects positively or negatively the term Profit or Loss (Net Income) as a result of an increase or decrease of the total income tax cost.

The incentive for our research was the impending tax reform in Greece (Law 4110/Gov. Gazette 17A/2013) which provides for a six percent (6%) increase in the corporate tax rate. This policy option was not expected⁵ and is in stark contrast to the positions announced by the parties in power⁶, the official positions of the associations of the largest productive classes⁷ (ACCI, SEV, GSEVEE) as well as the prevailing modern theoretical and empirical approaches that a reduction of the tax cost is more desirable by businesses (Neubig 2006) and would have an immediate positive impact on growth, while over time it would increase revenue by broadening the tax base (Diamond et al., 2011). Moreover, the important *Deferred Tax Asset Positions of banks*⁸ are of particular significance in view of their recapitalization because including DTA in regulatory capital reduces their need for additional funds. Furthermore, for the fiscal year 2013 significant changes applied to the method for calculation and the rates of tax depreciation, which prove to be one of the biggest causes, diachronically, of differences between book and tax income. The timing serves largely our research purposes because the Bill was introduced and referred to the relevant Parliamentary Committee for consideration at the end of 2012. It became a state law on 23/01/2013, and the new tax rate will apply to profits arising from fiscal years

¹ Mainly the Greek (GAAP) and the Commercial Code (Law 2190 on PLC & Law 3190 on Ltd.)

² The inclusion of this directive into Greek law forced approximately 314 listed in the ASE companies to switch from National to International Accounting Standards (IAS) for periods beginning on or after 31/12/2005.

³ See also: Graham et al. (2012)

⁴ Based on GAAP mainly (IAS & US) and those that are based on the tax rules and relevant laws of the country.

⁵ The previous period (2005-2012) was characterized by a tendency towards a gradual reduction of tax rates (from 29% to 20%).

⁶ See : the positions of the New Democracy party on corporate income tax (http://www.nd.gr/web//guest/press/-/journal_content/56_INSTANCE_c6UH/45738/789527), as well as Greek Prime Minister's speech at The Economist forum --17th Roundtable with the Government of Greece April 15th-16th 2013 - Athenaeum InterContinental Hotel-- (http://www.hazliseconomist.com/en/Press_releases)

⁷ See: www.acci.gr/acci/Home/EBEA_President_Proposal/tabid/788/ItemID/3870/View/Details/language/el-GR/Default.aspx , www.sev.org.gr, www.imegseev.gr/theseis-gseev/78/529-13-08-2012.

⁸ See related article of the magazine "The Economist" (10.12.2011 p. 74 f.), entitled "How lower taxes could hurt America's big banks".

starting from 01/01/2013 onwards. Also, during the reported period the statutory tax rate varied significantly (from 32% to 20%), which allows us to make comparisons over time and sensitivity analyses.

Our contribution to the literature is the following: Firstly, and as far as we know, there are few international-level investigations that use *hand-collected data* raised from the Annual Reports' tax notes, based on a representative and stable sample⁹ since the adoption of IAS/IFRS in the Common European Economic Area. Secondly, we complement existing literature, expanding research in the field of International Accounting Standard (IAS) 12 "Income Taxes"¹⁰. Additionally, we study firms and industries in a continuous changing tax regime and business environment, particularly affected by the financial crisis and economic recession. Our sample covers the years 2005 to 2012 and includes also all listed banks, which experienced unique in the European Economic Area events, such as the Greek banks' participation in the Private Sector Involvement (PSI) in the context of the restructuring of the Greek sovereign debt¹¹. The process involved the exchange of Greek Government Bonds (GGBs) with a series of new bonds, at a significant price discount, known as "haircut". A significant part of these PSI impairment losses was classified as Net Operating Loss - Carry Forwards with the corresponding Deferred Tax being recognized as receivable Deferred Tax Asset (DTA). These accounts seem to be very important for their capital needs assessment and correlated with their future profitability and cash flows for tax payment. (Gee and Mano, 2006; Skinner, 2008).

The research study, including the introduction, is divided into 5 sections. The second section explains how the *Temporary Differences* lead to the creation of Deferred Tax Positions. A reference is made to the requirements of the accounting standards IAS12 and US SFAS 109, focusing on the rules of recognition and measurement of *Differences* arising from the revaluation of DTPs in cases of tax rates change. Reference is also made to previous research. The third section describes the classification methodology and data analysis. The sample includes the largest (64) firms, 14 of which are banks, which are included in the composition of international certified indices (FTSE/ASE 20, FTSE/ASE 40 & FTSE / ASE 80) of the Athens Stock Exchange (ASE). The sample covers the period from 2005 to 2012 and on average 82.50% of the total market capitalization (ASE).

Our analysis consists of two stages. In the first we calculate the Book-Tax Gap, where we analyze the nature and composition of the differences, distinguishing between Temporary and Permanent Differences. Subsequently, we focus on temporary differences, which are proven to be greatly contributing to the creation of items of DTPs. The revaluations and adjustments of these positions form (increasingly or decreasingly) the final actual tax cost of an accounting year. In the next stage, we divide the Temporary differences into categories in order to highlight those that are mainly responsible for the gap between book-tax profits. This form of categorization is in our opinion the first detailed analysis of Temporary Differences since the adoption of IAS 12 "Income Tax" up to date, which is based on a sample that is continuous and stable over time. We find that the size, composition and trend of deferred tax positions vary significantly from year to year and between "Financial and Non-Financial firms". For these reasons, the study's results are reported separately for financial and Non-Financial Firms.

At the end of 2012 (3/5) of the sampled firms incur DTL. The total DTA of the minority (2/5) is more than five times higher. Average DTA in the banking sector rockets to 1.11 bn euros, with an increase of 477%. In non-financial firms, Deferred Tax Liabilities are prevalent, with the most significant components arising from Property, Plant & Equipment (PPE). In the

⁹ Amir, Kirschenheiter, and Willard (1997) collect data that are similar in terms of size and components but limited to uses from 1992 to 1994 and refer to US GAAP. Also Phillips, Pincus, Rego and Wan (2004) consider a longer period (1994-2000) but a random sample of firm years.

¹⁰ Seideman (2008), Poterba et al., (2007; 2010) and Raedy (2011) conduct similar research into the impact of the application of US SFAS 109 «Accounting for Income Taxes» on a sample of large companies in America.

¹¹ On 21 July 2011 the leaders of the member states of the Eurozone announced an economic plan for Greece known as Memorandum (MoU). During the third quarter of 2011, it was shown that Greece was facing difficulties in keeping up with the financial objectives (MoU) on which the original plan was based, so this led to a new agreement on 26 October 2011, which was finalized on February 21, 2012.

Bank industry it is the Deferred Tax Assets that prevail. The deferred assets positions related to NOL carry forwards cover on average 87% of the Deferred Positions, due to the impairment of the loans portfolio and the PSI.

In the fourth part we illustrate the potential Net Income Impact of the revaluation of firms' Deferred Tax Positions, with a counterfactual example in which the statutory tax rate is set at 26% for all firm-years from 2006 to 2012. We find out that a six percent increase in the statutory tax rate in year 2012 would substantially affect the net reported earnings of several sampled firms due the revaluation of the DTPs existing at the beginning of each year.

For firms with DTAs, the positive "short-run" Revaluation Effect is estimated at 37.5% of Net Income. The banking sector claims the lion's share, having enhanced asset and profits by 1.58 bn euros that would cover 1/3 of the year's loss. A reasonable question is whether banks will be able to offset these assets with future tax liabilities. Otherwise, they are obliged to write down the total amount of assets not susceptible to offsetting. In contrast, the industry firms with DTLs will experience a significant increase in long-term liabilities and a decrease in Net Income of (193) %, with the sector of industrial goods experiencing the greatest pressure (503%).

The Revaluation Effect seems to be associated with the magnitude, phase and composition of DTPs in the year of enactment of the new tax rate. The variation in the "short-run effect", arising from the heterogeneous DTPs across the sectors, could lead to reactions and incentives for or against a tax reform that focuses on the increase or decrease of corporate tax rates.

2. Taxation and the base issue of Generally Accepted Principles (GAAP)

Reflection on the need for an interperiod tax allocation of income tax expense in the financial statements has dominated for many years the Anglo-Saxon and American Accounting thought and practice (Black, 1966). The term "interperiod tax allocation" signifies the process whereby the Current and Deferred Tax expenses of a period should be allocated either in the statement of comprehensive income and/or the statement of changes in equity for the period.

In Greece, the reasoning of "deferred tax" is a new concept through IAS/IFRS and is not covered even today by any National Accounting Standard (GR GAAP) or tax provision. In 2002 the *European Union* (EU) required all firms listed in the Stock Exchanges of the 27 Member States to switch to IAS/IFRS¹² starting from the fiscal years beginning on or after 1 January 2005. This forced more than 7,000 listed firms to replace the National Accounting Standards with IAS/IFRS. Excluding a minimum of multinationals, the firms listed in Athens Stock Exchange (ASE) were forced to fully implement for the first time the IAS 12 from annual periods beginning on or after 1 January 2005.

2.1 Deferred Tax Positions According to IAS 12 "Income Taxes" and US SFAS 109: "Accounting for Income Taxes"

The purpose of Accounting for Income Taxes is to present information about the firm's taxes expense, using the Generally Accepted Accounting Principles (GAAP)¹³. GAAP accounting uses an accrual system, according to which revenue and expenses are recorded when a transaction occurs and not when cash is paid out (cash-basis system). In many tax regimes, firms' Book Income as recorded in their financial reports (computed under GAAP) differs from the Taxable Income (Tax Income), and while for many transactions book and tax treatment are the same, often the treatment differs. These Book-Tax Differences (BTDs) result not only from the application of two different rules in the calculation of Income (book income and taxable income) but also from two different measures of Assets, Liabilities and Equity. (Graham, et al.,2012).

¹² In this way the E.U. aims to contribute to improving the quality and increasing the transparency, reliability and comparability of the financial information provided (Whittington, 2005). Despite the widespread mandatory adoption of IFRS, there is relatively little evidence as to the related economic consequences (Ball, 2006; Daske et al. 2008).

¹³ Predominantly US GAAP, UK GAAP and IAS/IFRS.

IAS 12's¹⁴ objective is to set out the accounting treatment for income taxes. It deals with the accounting for the current and future tax consequences of: (a) Transactions and other events of the current period that are recognised in a firm's financial statements, and (b) the future recovery (settlement) of the carrying amount of assets (liabilities) that are recognised in a firm's balance sheet. The standard requires a firm to account for the tax consequences of transactions and other events in the same way that it accounts for the transactions and other events themselves. This standard also deals with the recognition of deferred tax assets arising from unused tax losses or unused tax credits, the presentation of income taxes in the financial statements and the disclosure of information relating to income taxes.

According to IAS 12, if a firm generates income as recorded in their financial reports, then they will report a corresponding tax expense, regardless of when they are actually required to pay the taxes. Therefore Tax Expense includes the Current and Deferred Tax. Current tax is the amount payable (recoverable) in income taxes on the taxable profit for a period while the "Deferred Tax" smoothens the gap between Tax Expense and Current Tax, resulting from the change in deferred tax positions (Assets / Liabilities) from year to year. Deferred Tax (DT) is thus the amount of income tax that has already been recognized mainly as expenses in profit or loss or outside profit or loss (either in OCI or equity) but will be paid in the future or the amounts expected to be recovered in future.

Deferred Tax is attributable to Book-Tax Differences (BTDs) between the measurement of Assets, Liabilities and Equity in accordance with the GAAP rules (book base) and that determined by the tax rules (tax base). Such differences may be either permanent or temporary. Permanent Differences are related to costs or revenues that affect only the taxable or only the accounting result (e.g. tax penalties and surcharges, various non-taxable incomes, such as income from dividends) and which do not create an obligation to recognize deferred tax. Temporary Differences, in contrast, affect the accounting and taxable income but at a different time (e.g. provisions for staff retirement benefits, despite having shaped the accounting result will be tax deductible at the time of compensation payment). Temporary differences are then divided into: a) taxable temporary differences, leading to payment of higher taxes in the future and at present to recognition of "Deferred Tax Liability" (DTL) and b) deductible temporary differences leading to paying more tax in the current year and less in future periods for which a "Deferred Tax Asset" (DTA) is recognized. More specifically, the following applies to assets: if their book basis is greater than their tax basis, the result is a taxable temporary difference, while if the opposite is true (tax basis > book basis) the result is a deductible temporary difference. Regarding obligations, if the book basis exceeds the tax base the result is a deductible temporary difference.

Current tax Assets/liabilities and Deferred Tax Assets/Liabilities should be presented separately in the Statement of Financial Position. DTAs/DTLs should not be classified as current assets/liabilities. Current tax assets/liabilities as well as DTAs/DTLs should be offset only if there is a legal basis for that offset. Expense (or income) for the period for income taxes will be presented in the Income Statement or the Statement of Comprehensive Income, and in some cases only through the statement of changes in equity.

According to the standard, a complete and detailed list of information (Notes) must be disclosed (IAS 12.79 - 12.88), such as: a) the current tax b) the amount of deferred tax expense relating to the origination and reversal of temporary differences and to changes in tax rates c) the amount of deferred tax assets or liabilities recognised in the statement of financial position and the amount of deferred tax income or expense recognised in the income statement for each type of temporary difference and unused tax loss and credit, d) the aggregate current and deferred tax relating to items reported directly in equity, e) the amounts of deductible temporary differences, unused tax losses, and unused tax credits; and f) a reconciliation of amounts of tax or a reconciliation of the rate of tax.

¹⁴ All information about the Standard is provided by the official website of the IASB <http://www.ifrs.com>.

2.2 Accounting for deferred tax - Measurement issues - Change in tax rates

The Deferred Tax Positions (DTAs and DTLs) “are measured at the end of each period using tax rates expected to apply to the period that the asset will be recovered or the liability will be settled, based on tax rates (and tax laws) that have been enacted or substantially enacted, until the balance sheet date” (12.47). But where “the announcements of tax rates by the government have essentially the power of an actual enactment (some jurisdictions), which can formally follow even after the lapse of several months, tax assets and liabilities are measured using the announced tax rate (12.48)”. In contrast, the corresponding US GAAP “SFAS 109” (27) is completely absolute with regard to the point that the “future tax rates” have been sufficiently established, and provides that the relevant procedure needs to have been completed and be formally put into effect (i.e. the law needs to have been passed by Congress).

The book value of DTAs and DTLs is reassessed at each balance sheet date where temporary differences are recognized or reversed. This can occur because of a change in tax rates or tax laws, reassessment of the collectability of deferred tax assets (e.g. reassessment of future profits), change in the way of recovery of the asset (e.g. capital gains against tax profits). The firm should also reassess at each reporting date of the financial statements the recoverability of the recognized and unrecognized deferred tax assets.

Therefore, according to the above in any case of change in the current tax regime or tax rates, deferred tax positions of the balance sheet (assets or liabilities) are revalued and the differences arising adjust the items of deferred tax positions (IAS 12.58-60). For transactions and other events recognised in profit or loss, any related tax effects are also recognised in profit or loss. For transactions and other events recognised outside profit or loss (either in other Comprehensive Income or directly in equity), any related tax effects are also recognised outside profit or loss (either in other comprehensive income (OCI) or directly in equity, respectively. (IAS 12.60, 61&63)¹⁵. This obliges us to a sustained and detailed monitoring of all original sources and recognition of temporary differences known as «*backwards tracing*». The US SFAS 109 makes however few exceptions and requires all revaluation disputes of the previous case to go through the results of the period regardless of the accounting treatment and initial recognition of deferred taxes¹⁶.

2.3. Literature Review

There are only few empirical studies examining how the composition of corporate deferred taxes can affect firm position. The main reason is that disaggregating deferred taxes requires hand-collection and categorization of data from the annual reports, an exhausting and difficult task indeed. The most comprehensive recent study is that of *Poterba et al. (2011)* where the authors investigate the way temporary deferred tax positions affect managerial preferences regarding a transition from one tax regime to another. Using data from the tax footnotes of Fortune 50 firms for the period 1993-2004 a panel data set comprising disaggregated deferred tax assets and liabilities into their component parts is then constructed. Results show substantial heterogeneity in deferred tax positions among U.S corporations and that in general deferred tax liabilities are greater than deferred tax assets. More interestingly evidence is provided that this heterogeneity affects substantially the impact of statutory tax rate changes on Net Income due to revaluation of deferred taxes positions. As a consequence the authors conclude that the recognition of firms’ divergent incentives is important for understanding the political economy of tax reforms.

¹⁵ Such cases involve items from revaluation of tangible and intangible assets (IAS 16.31 & IAS 38.75), corrections of reserve earnings due to changes in accounting policies and valuation methods (IAS 8.22 & IAS 8.42) and the revaluation of financial instruments of the category “Available for sales”.

¹⁶ It refers to the financial instruments available for sales. Also, in both models revaluation differences arising from business combinations affect in most cases the goodwill despite the results.

In a similar study, *Raedy et al., 2011* test the information content of book-tax differences (BTDs) disclosures. Based on detailed hand-collected data from the Fortune 250 from 1993 to 2007 they initially dichotomized BTDs to temporary and permanent differences and then tried to determine which specifically matter to investors. Contrary to their expectations authors found little evidence of value relevance of disaggregated tax components. More specifically among 41 individual BTDs they found only 3 that were associated with current stock returns. Given that previous studies reported that aggregated BTDs are associated with various characteristics of earnings, the authors stress the need for future work to explain why the sum of BTDs are value relevant but the individual parts are not.

Philips et al. (2004) examined whether the changes in net deferred tax liabilities (DTL) and its components could be used to detect earnings management. Their hand-collected (from the firms' Form 10K income tax footnote disclosures) final sample comprised 396 firm-years from US incorporated firms for a seven-year period (1994-2000) starting after the year that SFAS No 109 became effective (1993). Findings revealed that the deferred tax component reflecting revenue and expense accruals and reserves was significantly useful in explaining the probability of earnings management.

In another study, *Amir et. al. (1997)* classified deferred tax components from Fortune 500 companies over 1992-94 into seven main categories: deferred taxes from depreciation and amortization, losses and credits carried forward, restructuring charges, environmental charges, employee benefits, SFAS No. 109 valuation allowances, and other net deferred taxes. Their purpose was then to examine whether they provide value relevant information. Deferred taxes from restructuring charges were found to have valuation coefficients larger than other deferred tax components. In general, results indicated that investors' valuation of deferred taxes depends on when these deferred taxes reverse.

The manner by which investors evaluate tax deferrals in the light of the Tax Reform Act (TRA) of 1986 was the subject of *Givoly and Hayn (1992)* empirical study. The TRA reduced the corporate tax rate from 46 to 34 percent, a fact which according to the authors should have led to a proportional decline in the value of deferred tax liabilities and a corresponding increase in the value of equities. This reasoning formed their basic hypotheses tested in a two-year period preceding the enactment of the TRA and around 130 identifiable related major news events. Results indicated that investors do anticipate the deferred tax liability as a real liability discounting it to its present value according to the likelihood and timing of its settlement.

One year after the study of Givoly and Hayn, *Chen and Schoderbek (1993)* studied the effect of a 1 percent increase in US corporate tax rate realized with a new tax reform in 1993. General findings suggested that financial analysts failed to include the deferred tax adjustments in their earnings forecasts and as a consequence their ability to understand complex accounting rules was limited.

3. Sample, methodology - Assumptions & Limitations

As mentioned above, our research aims to provide a complete and comprehensive view of the importance, composition, origin and evolution of the Deferred Tax Asset and Liability positions of listed firms over the period applicable to IAS 12. These data are then used to reassess the effect of a tax rate change on corporate profits, the structure of the balance sheet and the ability to pay tax, which is often underestimated or not taken into account by those making the relevant political decisions.

3.1 Sample Construction - Assumptions and Limitations

As mentioned above, the information provided on income taxes (current and deferred) through the Financial Statements which are prepared in accordance with IAS/IFRS, is limited to the net liquidated value of deferred tax positions, assets or liabilities and the effect of their annual change on the results. For this reason, the standard requires a complete and detailed list of information to be disclosed (Notes) (IAS 12.79 - 12.88) along with annual and periodic reports.

Also, once the balance sheet date changes in tax rates or tax laws are enacted or announced, a firm is required to disclose any significant effect of those changes on its current and deferred tax assets and liabilities (see also IAS 10 "Events after the balance sheet date").

We found that none of the certified machine-readable databases¹⁷, either in Greece or internationally, includes data and information to allow for a stable long-term detailed inventory, categorization and analysis of the composition, origin and changes in deferred tax positions. This makes extremely difficult any further in-depth research approach based on identifying types and causes for the creation of temporary and permanent differences that contribute to the Offset of Tax Accounting profits.

To overcome the above limitations and difficulties, the data and information necessary for our research were hand-collected from the financial statements and their accompanying disclosures, tax-footnotes and analyses of the Consolidated Annual Reports of firms. These Annual Reports are made publicly available in text format (PDF) on the official website of the Athens Stock Exchange and cover the financial years from 2004 to 2012.

The data were then homogenized and stratified so as to be available as qualitative and quantitative panel data for each firm and year, covering the entire spectrum of current and deferred taxation. Indicatively, we mention: the amount (before offsetting) of deferred tax positions separately (Assets - Liabilities - Equity), the composition (cause of creation) of items at the beginning and end of each year, the change that occurred and the impact it had on results either in equity of the year (accounting representation), the agreement between the (offset) size of the financial statements with what is disclosed in notes, and reconciliation between theoretical (nominal tax rate) and actual (effective tax rate) annual tax burden. The fundamental difficulties encountered in classifying data concern mainly the depth of analysis, the uniform presentation and the quality of the information provided.

The sample consists of the sixty-four (64) largest firms (14 financial and 50 non-financial) included in the composition of internationally certified indices of the Athens Stock Exchange (FTSE / ASE 20, FTSE / ASE Mid 40 & FTSE / ASE Small Cap 80)¹⁸. Choosing the above indices ensured that our sample included the largest firms in terms of market capitalization, trading volume and dispersion, whose shares are regularly traded. The capitalization of the firms in our sample covers on average 82.50% of the total market capitalization (ASE). Three (3) holding companies are not included in the sample because of different objects and heterogeneous presentation of their financial results in relation to their predecessors. Firms that published financial reports for less than 4 years were also excluded.

The time period includes the financial years from 2005 to 2012, where we have mandatory and full implementation of International Financial Reporting Standards (IAS/IFRS). It is pointed out that during the test period (2004-2012) the statutory tax rate for businesses fluctuated (from 32% to 26%), which enables us to make comparisons and sensitivity analyses on a representative and stable sample. Additional information on firms' characteristics of the Sample is given in Appendix (A).

3.2 Summary and Analysis of Findings

Our analysis begins with the presentation of descriptive statistics concerning the *Book-Tax Gap* and its relationship with the temporary differences. Given the unique characteristics and

¹⁷ For instance, in the electronic database of the Athens Exchange (www.ase.gr) but also in "Amadeus" (www.amadeus.com) there is not even available information on the amounts of deferred tax positions of Assets and Liabilities and on deferred taxes recognized in the Profit/loss or equity, which are reported in items "Non-current assets / liabilities and Taxation". Clearly better information is available from the Database Thomson Reuters: Worldscope (WC) (www.thomson.com/financial), but here the analysis provided is also limited to the settled items of the Balance Sheet and profit and loss account (net basis).

¹⁸ The index FTSE / ASE 20 is a large-cap index that includes the 20 largest listed companies (blue chip). The FTSE / ASE Mid 40 (mid-cap) includes the next 40 companies, and the FTSE/ASE Small Cap 80 comprises the next 80 companies, those were created to provide a benchmark for the performance of ASE in real time, where market transactions of derivatives associated with the index can be supported.

significant diversification the banking sector presents with relation to the magnitude, sign and causes of Deferred Tax Positions, and the impact of the financial crisis, findings are presented separately for Financial (banking sector) and non-financial corporations (other sectors).

Table No.1 shows the annual median and the aggregates (cumulatively) of: a) the Book-Tax Gap b) the Temporary Difference, and c) the share of the latter as percentage (%) in the Temporary Difference / Book-Tax Gap. We define as “Book-Tax Gap”¹⁹, the difference between the consolidated pretax accounting income and the taxable income for the year. The Taxable Income is calculated as Current Tax Expense divided by each year’s Corporate Statutory Tax Rate in Greece. The Temporary Differences²⁰ are calculated respectively, by dividing the Deferred Tax Income or Expenses by the current tax rate.

The first three columns of tables (1a & 1b) refer to the median. The share as a percentage (%) occupied by temporary differences in Temporary Difference / Book-Tax Gap is the median of the individual percentages that are calculated at firm level for each year.

Table 1(a): Non Financial Firms - Book-Tax Income Gap and Share Attributable to Temporary Differences (€ ' 000)

Table 1a: Non Financial Firms - Book-Tax Income Gap and Share Attributable to Temporary Differences (€'000)								
Year	Number of Firms	Median Firms Book-Tax Income Gap	Median Firms Temporary Differences	Median Share Attributable to Temporary Differences	Aggregate Firms Book-Tax Income Gap	Aggregate Firms Temporary Differences	Aggregate Share Attributable to Temporary Differences	Period Statutory Tax Rate
2004								35.00%
2005	50	1,787	-2,060	-69.81%	74,511	124,543	167.15%	32.00%
2006	50	5,048	-1,795	-47.04%	261,168	-17,813	-6.82%	29.00%
2007	50	4,102	-3,729	-77.47%	373,102	-446,837	-119.76%	25.00%
2008	50	-1,472	978	-47.90%	-1,498,674	1,286,859	-85.87%	25.00%
2009	50	-2,370	-34	-49.51%	184,359	-902,522	-489.55%	25.00%
2010	50	-8,287	2,576	-40.55%	-2,672,025	641,749	-24.02%	24.00%
2011	50	-15,759	120	-26.56%	-3,450,369	236,006	-6.84%	20.00%
2012	48	-17,714	3,877	-31.84%	-1,519,904	188,917	-12.43%	20.00%
2013								26.00%

There are significant price and trend divergences of the median for the relationship between Temporary Differences and *Book-Tax Income Gap* as percentage points (%). The largest value of 77.47% occurs in 2007, while the lowest is recorded in 2011 at 26.56%. The sign of the median remains firmly negative, and is formed on the basis of the signs of the sizes involved in its calculation (Temporary Differences / Book-Tax). The median of Book-Tax Income Gap, from the year 2005 until the year 2007 has maintained a positive sign (Book profit > taxable), while temporary differences are consistently negative (Taxable Temporary Differences > Deductible). From 2008 onwards we have a complete reversal of sizes and trends. The median of the Difference (Book-tax profits) becomes negative (taxable income > Book) with a strong upward trend, while we have a change of the sign of temporary differences to positive, with deductible differences exceeding taxable differences (deductible temporary differences > Taxable). This change of signs can be attributed to two factors. The first concerns the recording, for the years that followed, of very substantial accounting losses which on one hand reversed the relationship “Book / taxable profits”, while on the other a considerable part of those losses was described as “Deductible Temporary Difference”, which in turn affected the relationship “taxable / deductible differences”. The second factor is connected with the shrinkage of

¹⁹ See also: Poterba et al. (2011), p.39.

²⁰ On alternative approaches, methods and misconceptions see Graham et al.(2008), pp. 21-28.

temporary taxable differences (due to revaluation) as a consequence of the gradual reduction of tax rates from 2009 onwards.

The amounts in the next three columns provide aggregates of the same sizes. These data provide a picture of the absolute size of the temporary differences without varying significantly, with relation to the signs and trends of those of the median, excluding outliers. For example, for the year 2005 the median gives negative temporary differences as percentage, too 69.8%, while total temporary difference is instead positive and amounts to 124.6 million euros, representing 167.15% of the *Book-Tax Income Gap* 74.6 million. All temporary differences, however, include a positive (deductible) difference of 600 million of the firm OTE SA, which corresponds to 91% of the *Book-Tax Losses Gap* for the year, which was (658) million. If we eliminate both of these amounts from the measurements, then the total temporary differences for that period are adjusted to negative, 475 million (taxable). The *Book-Tax profit gap* becomes positive, 733 million, and their relationship stands at 64.8%, a proportion consistent with the corresponding trend and percentage of the median. Similar discrepancies and differences in signs we also have in 2006 and 2009, which are largely due to outliers in the figures of Technical Olympic SA and PPC SA.

Table 1(b): Financial Firms (Banks) - Book-Tax Income Gap and Share Attributable to Temporary Differences, (€' 000)

Year	Number of Firms	Median Firms Book-Tax Income Gap	Median Firms Temporary Differences	Median Share Attributable to Temporary Differences	Aggregate Firms Book-Tax Income Gap	Aggregate Firms Temporary Differences	Aggregate Share Attributable to Temporary Differences	Current Period Statutory Tax Rate
2005	14	45,018	-2,664	-27.66%	1,272,157	-222,225	-17.47%	32.0%
2006	14	86,552	-14,457	-25.91%	1,116,674	-234,903	-21.04%	29.0%
2007	14	156,783	-30,000	-50.74%	3,190,466	-976,512	-30.61%	25.0%
2008	14	-20,611	53,476	-40.09%	1,379,844	-221,796	-16.07%	25.0%
2009	14	-7,764	19,772	-20.04%	-223,343	361,488	-161.85%	25.0%
2010	14	-81,246	41,650	-48.67%	-2,625,058	1,153,596	-43.95%	24.0%
2011	8	-4.638.829	3,545,515	-50.43%	-40,732,679	25,175,815	-61.81%	20.0%
2012	6	-1.368.560	841,285	-99.56%	-7,963,195	7,290,100	-91.55%	20.0%
2013								26.0%

The image of the *banking industry* has special features and this is why it is presented separately. The largest negative value of the median as a percentage 99.56% occurred in 2012, while the lowest in 2009 (20%). Its sign remained firmly negative as in the above case (Non Financial), but with an ever-increasing trend. We also observed a positive value for the *Book-Tax Gap* median from 2005 to 2007, negative on temporary differences and a complete reversal of their signs after 2008. In the year 2009 the median of Temporary Differences as a percentage of the *Book-Tax Income Gap* decreased significantly from 40 % to 20%. The corresponding aggregate share jumped to 162% from 16% due to complete reversal of the relationship of *Book-Tax profits* and *Temporary Differences*. In 2008 the *Book Profit* exceeded the *Tax Profit* by 1.38 billion whereas in 2009 it fell short by 0.22 billion, primarily due to the recording of significant (accounting) losses in the industry²¹ as a result of higher provisions for impairment of Assets and Credit Risk coverage due to the financial crisis and recession. These predictions are for the most part permanent differences and tax non-deductible so there is no corresponding reduction in the

²¹ The overall decrease in pre-tax profits amounted to 2,342 billion. The reduction for banks ETE, ATE, EFG was 30% 22% and 18% respectively.

assessable profits²². The totals for the Temporary Differences also show a change of trend, and Taxable Differences (Liabilities) 0.22 bn become Deductible Differences (Receivables) 0.36 billion. The total change of the temporary difference 0.58 billion, though, does not offset that of Book-Tax profit Gap 1.603 billion. The first is largely due to the creation of new Deductible Differences from “Tax losses carried forward” and the revaluation (reduction) of current taxable differences as a consequence of the gradual reduction of tax rates.

In the year 2011 we have the climax of the negative effects of the crisis, with recorded Book Loss totaling 39 billion, much of which 31.5 billion was caused by the valuation haircut of Greek government bonds, in regards to the PSI. From that loss, an amount of approximately 21.7 billion is expected to be tax deductible²³, catapulting the Deferred Tax Assets (DTAs) to 4 billion (Table 2.b). The taxable profit amounted to 1.7 billion, thus enlarging the Book-Tax difference to 40.7 billion. In both cases, the temporary differences are responsible for about half of the Book-Tax Profit Gap.

Tables No. 2a & 2b give us additional information on the book value of assets and equity and market valuation of firms in the sample. The market capitalization is calculated by multiplying the weighted average number of shares in circulation, on 31/12/XX of each year, by the weighted close, derived from the electronic database of the ASE. The remaining hand-collected data come from the database that we have created and described above. We then present the number of firms exhibiting DTAs and those exhibiting DTLs, the total amounts of deferred Tax Positions and the percentage of the Total Assets that the latter represent, and their capitalization. There is significant heterogeneity in terms of the size, form, trend and evolution of deferred tax positions between the banking and non-financial firms and therefore they are reported separately. During the first reported year (2005), 23 from a total of 50 non-financial firms show DTAs totaling 402 million whereas the other 27 DTLs of 1.155 billion. At year-end 2012, 16 of the 48 sampled firms have DTAs of € 0.33 billion (equivalent to 0.5% of assets and 1.13 % of the equity) and 32 have a four times higher DTLs of EUR 1.3 billion (1.6 % of Total Assets and 4.4% of the Equity, respectively). So we have a gradual reduction in the number of firms displaying (DTAs) and a corresponding increase in those reporting DTLs.

²² Taxable profits decreased by 0.739 billion and concern mainly the National Bank 20%, Alpha Bank 20%, Cyprus 21% and Piraeus 37%.

²³ The PSI loss is deductible in thirty 30 equal annual installments, starting from the year in which the exchange of securities takes place and regardless of the time of holding bonds (Section 13, Article 109 of the Codified Law 2238/1994, as amended by Law 4110/2013).

Table 2a: Non - Financial Firms- Sample Characteristics by Year (€'000)												
Year	Number of Firms	Aggregate Total Assets of Firms	Aggregate Total Equity of Firms	Cross-sectional Std. Dev. Of Net Deferred Tax Positions	Firms with Net DTA		%	%	Firms with Net DTL		%	%
					Firms	Aggregate Value	Aggregate (Value/Total Assets)	Aggregate (Value/Total Equity)	Firms	Aggregate Value	Aggregate (Value/Total Assets)	Aggregate (Value/Total Equity)
2005	50	61,117,155	26,771,032	67,436	23	402,030	0.66%	1.50%	27	-1,155,313	-1.89%	-4.32%
2006	50	66,188,292	28,918,973	60,316	20	309,193	0.47%	1.07%	30	-1,148,928	-1.74%	-3.97%
2007	50	75,133,857	31,168,574	61,655	15	223,688	0.30%	0.72%	35	-1,369,695	-1.82%	-4.39%
2008	50	81,076,255	30,527,493	54,323	16	333,343	0.41%	1.09%	34	-1,273,752	-1.57%	-4.17%
2009	50	82,133,751	31,750,087	83,532	16	288,635	0.35%	0.91%	34	-1,649,553	-2.01%	-5.20%
2010	50	84,522,504	31,488,035	80,079	18	307,751	0.36%	0.98%	32	-1,592,270	-1.88%	-5.06%
2011	50	84,202,197	29,610,691	79,037	17	283,525	0.34%	0.96%	33	-1,543,545	-1.83%	-5.21%
2012	48	80,859,910	29,538,926	57,741	16	332,550	0.41%	1.13%	32	-1,282,911	-1.59%	-4.34%

Table 2b: Financial Firms (Banks) - Sample Characteristics by Year (€'000)												
Year	Number of Firms	Aggregate Total Assets of Firms	Aggregate Total Equity of Firms	Cross-sectional Std. Dev. Of Net Deferred Tax Positions	Firms with Net DTA		%	%	Firms with Net DTL		%	%
					Firms	Aggregate Value	Aggregate (Value/Total Assets)	Aggregate (Value/Total Equity)	Firms	Aggregate Value	Aggregate (Value/Total Assets)	Aggregate (Value/Total Equity)
2005	14	256,444,936	17,693,121	125,657	12	1,125,891	0.44%	6.36%	2	-37,028	-0.01%	-0.21%
2006	14	315,548,817	25,281,459	131,723	11	1,123,605	0.36%	4.44%	3	-62,156	-0.02%	-0.25%
2007	14	413,955,261	32,184,245	119,563	12	902,825	0.22%	2.81%	2	-93,745	-0.02%	-0.29%
2008	14	485,059,904	28,957,247	127,679	13	1,359,531	0.28%	4.69%	1	-35,556	-0.01%	-0.12%
2009	14	520,553,905	38,080,604	126,528	13	1,268,121	0.24%	3.33%	1	-41,923	-0.01%	-0.11%
2010	14	530,239,317	37,215,180	146,083	13	1,889,552	0.36%	5.08%	1	-7,449	0.00%	-0.02%
2011	8	370,690,267	4,098,845	566,771	8	4,023,856	1.09%	98.17%	0	0	0.00%	0.00%
2012	6	307,763,590	-3,634,199	874,878	6	6,692,560	2.17%	-184.16%	0	0	0.00%	0.00%

Table 2c: Total Sample Characteristics by Year (€ 000)

Year	Number of Firms	Aggregate Total Assets of Firms	Aggregate Total Equity of Firms	Total Market Capitalization	%	Cross-sectional Std. Dev. Of Net Deferred Tax Positions	Firms with Net DTA		%	%	Firms with Net DTL		%	%
							Firms	Aggregate Value	Aggregate (Value/Total Assets)	Aggregate (Value/Total Equity)	Firms	Aggregate Value	Aggregate (Value/Total Assets)	Aggregate (Value/Total Equity)
2005	64	317,562,091	44,464,153	122,385,680	36.33%	91,059	35	1,527,921	0.48%	3.44%	29	-1,192,341	-0.38%	-2.68%
2006	64	381,737,109	54,200,432	157,928,710	34.32%	88,876	31	1,432,798	0.38%	2.64%	33	-1,211,084	-0.32%	-2.23%
2007	64	489,089,118	63,352,819	195,502,470	32.41%	83,889	27	1,126,513	0.23%	1.78%	37	-1,463,440	-0.30%	-2.31%
2008	64	566,136,159	59,484,740	68,176,650	87.25%	88,830	29	1,692,874	0.30%	2.85%	35	-1,309,308	-0.23%	-2.20%
2009	64	602,687,656	69,830,691	83,520,520	83.61%	104,970	29	1,556,756	0.26%	2.23%	35	-1,691,476	-0.28%	-2.42%
2010	64	614,761,821	68,703,215	54,007,220	127.21%	117,654	31	2,197,303	0.36%	3.20%	33	-1,599,719	-0.26%	-2.33%
2011	58	454,892,464	33,709,536	26,802,380	125.77%	280,309	25	4,307,381	0.95%	12.78%	33	-1,543,545	-0.34%	-4.58%
2012	54	388,623,500	25,904,727	33,766,010	76.72%	452,603	22	7,025,110	1.81%	27.12%	32	-1,282,911	-0.33%	-4.95%

Table 2(a): Sample Characteristics by Year (€ ')

In contrast, in the banking sector, the vast majority of firms displays DTAs with a strong upward trend, associated with the massive recognition of tax losses carried forward, as discussed in the previous paragraph.

At the end of 2012, all remaining (6) -- out of the initially 14 before the crisis -- firms have deferred tax asset totaling 6.7 billion euros, equivalent to 2.17% of their assets (308 billion) and 184% of (negative) equity (3.6 billion), while in 2 of them the Deferred Tax Position is well above 100% of their equity.

Table 2 (b): Banks - Sample Characteristics by Year (€ '000)

The Table, 2c, shows that the capitalization of the firms in our sample covers on average 82.50% of the total market capitalization (ASE). There is significant heterogeneity regarding the amount, composition, change, and direction of Deferred Tax Position both among industries and between firms in the same industry.

At the end of 2012, the majority of firms in the sample, 32 out of 54, display DTLs of 1.28 billion euros in total and an average of 40 million (1.28 bn/32). The total DTAs of the minority (22), however, is more than five times and reaches 7 billion euros. While the mean DTAs is at 0.319 million (7bn/22), in the banking industry it amounts to 1.11 billion (6,693/6). The overall increase in (DTA) in the period amounted to 477%.

Deferred Net Asset Positions lead to the assumption that future Tax profits exceed Book profits (announced) and indicate the existence of tax reserves, such as deferred taxes from Losses carried forward. This can lead to reduced or no payment of taxes in future years, if there are sufficient taxable profits over a five-year period, or in exceptional cases (banking sector) over a thirty-year period.

In conclusion, an increase in tax rates²⁴, taking effect in the year 2012, would benefit firms with DTAs (a minority) by enhancing their Assets and profitability, whereas it would instead affect negatively the period results and increase the liabilities of the firms with DTLs, which are the majority.

Table 2(c): Total Sample Characteristics by Year (€' 000)

Tables 3 and 4 explore, separately for non-Financial and Financial Firms (Banks), the Net (offset) increases in temporary differences that have contributed to the rise in the book-tax income gap and present detailed information on the composition of deferred tax positions. Table 3 disaggregates deferred tax positions into their constituent components, and indicates the sources of the most important temporary book-tax differences. The results show significant variations in the sizes and the signs of the Deferred Tax Positions.

After the initial implementation of the Standard (2005), *Employee & Other Post-Employment Benefits, Accruals and the Provisions* are included in the most important sources of *Deferred Tax Assets Positions*, while *Property, Plant & Equipment (PPE)* (mainly due to differences in depreciation on tangible assets & leasing), *Tax Losses carry forwards* as well as *Construction Contracts* are included in the Liabilities. In the last fiscal year of the sample (2012), the most important Deferred Assets Positions derive once again from *Employee & Other Post-employment Benefits*. *Construction Contracts* come next -- which since 2011, from Deferred Tax Liabilities converted into Deferred Tax Assets, recording an overall change of 675 % and finally *Tax Losses carry forwards* with similar behavior after 2006 and total change of 318%. The above is not surprising and is largely due to the financial crisis that began in 2009 with the impact on the real economy being reflected in the financial statement of firms and reaching the peak in 2012.

²⁴ Neubig (2006) argues that according to a questionnaire survey the majority of companies prefer lower tax rates than other aid or structural tax reforms.

Regarding the *Deferred Tax Liabilities*, apart from the diachronic prevalence of Property, Plant & Equipment, investments in subsidiaries and mark-to-market adjustments of Properties have a significant contribution and seem to follow the rise and fall of the general market by making a change of 2,000% and 1,197%, respectively. Furthermore, significant changes 1,363% are recorded on the DT Assets from mark-to-market adjustments of financial instruments as well as on the Liabilities that are related to the intangible assets 595%.

Diachronically, the most important source of the Deferred Tax Assets is the “Employee Benefits” which include Employee, Pensions & Other Post-Employment benefits, while the most important source of the Liabilities is the Property, Plant & Equipment (PPE), which mainly concern various differences in depreciation on tangible assets & leasing. *The result is consistent with the Poterba (2011) study.*

Table 3: Non-Financial Firms Detail of Select Components of Net Deferred Tax Positions, Average per Firm, 2005 - 2012 (end of Year), (€' 000)

Related items	2005	2006	2007	2008	2009	2010	2011	2012
Intangible assets	900	-2,275	-3,039	-7,353	-5,388	-4,307	-4,508	-4,452
(PPE) Property , Plant & Equipment and Leases	-42,011	-35,682	-39,870	-40,738	-47,837	-42,725	-40,950	-37,881
Investments & other non-current receivables	1,181	968	-10,904	-11,694	-9,525	-17,921	-18,037	-22,668
Tax Losses carry forwards	-6,141	6,199	9,434	15,896	12,788	14,726	13,034	13,633
Mark-to-market adjustments - Properties	755	-28,687	-25,376	-20,810	-21,429	-19,326	-18,156	-8,287
Mark-to-market adjustments - Financial instruments	394	3,089	8,935	6,225	4,590	4,231	2,937	5,760
Construction Contracts	-3,768	-7,470	-7,655	-11,340	-5,654	-611	22,924	21,654
Employee & Other post-employment benefits	23,178	19,853	20,472	18,525	17,500	19,617	18,706	12,917
Provisions and similar items	3,928	2,209	4,143	6,658	7,358	6,270	5,540	5,155
Accruals and deferrals	5,864	7,457	11,185	9,550	8,108	5,046	4,260	5,494
Other Long - Sort term Assets & Liabilities	1,729	4,463	4,191	4,400	2,725	3,501	5,553	8,951
Number of Firms /	48	48	48	48	48	48	48	46
Sample Size	50	50	50	50	50	50	50	48

In the banking sector, mainly due to the structure and size of their Financial Statement, the Deferred Tax Positions have specific characteristics and for this reason they are presented *separately*. By the end of the first reporting year (2005), the most important sources of the Deferred Tax Assets are related to *Tax free reserves and Securities reserves, Impairment of Loans Portfolio and Employee & Other post-employment benefits* while the Deferred Tax Liabilities, which are significantly lower, mostly derive from *Property - Plant - Equipment & Leases (PPE) (depreciation differences) and Mark-to-market adjustments of Securities*. At the end of 2012, we have absolute prevalence of the Deferred Tax Assets Positions, with the DTAs components related to *Impairment of Loans Portfolio, Mark-to-market adjustments of Securities and Derivatives* increasing significantly after the beginning of the recession (2009) and covering approximately 40% of the total deferred tax assets. If we weigh up the amount of DTAs which derive from *Impairment losses on Greek government bonds (GGBs) and state-related loans*

under the PSI - NOLs Carryforwards, then the uses cover 87% of the Deferred Positions of the Assets.

The latter takes on special significance because *counting the deferred tax losses from the PSI in the regulatory capital of the Greek banks would reduce their capital needs and significantly ease the cost of recapitalization* (Skinner 2008). With DTAs reaching 6.7 billion Euros at the end of 2012, representing 184.16% of the Negative Book Equity (3.63 billion-Table 2.b), there are legitimate questions, under the existing economic conditions, as to the possibility of ensuring the necessary future profitability in order for the other Losses (NOL Carryforwards) from 2005 to 2012 to be used.

Table 4: Components of Net Deferred Tax Positions, Average per Bank, 2005-2012 (€ 000)

Table 4 : Financial Firms - Components of Net Deferred Tax Positions, Average per Bank, 2005-2012 (€ 000)								
Related items	2005	2006	2007	2008	2009	2010	2011	2012
Intangible assets & (PPE) Property – Plant-Equipment & Leases	-1,097	-9,458	-28,245	-23,477	-22,141	-27,675	-47,694	-31,756
Mark-to-market adjustments - Securities and Subsidiary-related Items	-15,333	-6,200	9,289	57,136	53,855	73,351	152,468	196,273
Mark-to-market adjustments - Derivatives	2,193	23,837	9,038	17,985	-12,621	21,432	72,306	101,602
Impairment of banks' loan Portfolios	43,655	44,051	24,768	-1,813	24,751	38,453	149,799	307,410
(PSI) NOL Carry forwards Impairment of state-related loans	0	0	0	0	0	0	695,731	715,216
Others NOL Carry forwards	4,798	3,747	7,580	27,827	33,961	52,703	29,140	86,692
Employee & Other post-employment benefits	43,169	36,702	29,063	25,178	23,931	20,093	22,614	24,626
Interest - currency and Tax rates adjustments	3,218	922	-897	-4,259	-7,896	765	8,464	7,388
Tax-free reserves under special laws	49,039	42,316	33,530	8,042	6,270	-283	12,293	5,539
Accruals , Deferrals, Revenue, Provisions and others Differences	-109	10,502	2,998	12,892	5,640	3,172	16,757	35,278
Number of Firms	14	14	14	14	14	14	8	6
Sample Size	14	14	14	14	14	14	8	6

Tables 5 and 6 provide further information in order to assess the significance of the Deferred Tax Positions (DTPs) in relation to the Assets and the market valuations of firms in the sample. Table 5 shows the distribution by use of the DTPs (Assets/Liabilities) as a percentage of the Total Assets.

The distribution of the total sample gives on average a balanced picture between DTPs as a Share of Firm Assets 54% and of firm liabilities 46%, mainly due to the impact of the significant DTPs of the Assets of the banking sector (table 5.a). Over 2/3 of the firms show Positive DTAs or Negative DTLs position, which collectively accounts for less than 3% of their Assets, while 17% range from 3% to 5%, and about 7% that are declining exceed 5%.

Table 5. Total Distribution of Net Deferred Tax Positions as a Share of Firm Assets, 2005-2012.

Table 5.: Total Distribution of Net Deferred Tax Positions as a Share of Firm Assets, 2005-2012							
Year	Sample firms	Firms with Net Deferred Tax Liabilities			Firms with Net Deferred Tax Assets		
		<= -5%	-5 % to -3%	-3% to 0%	0% to 3%	3% to 5%	>=5%
2005	64	9.38%	9.38%	26.56%	46.88%	6.25%	1.56%
2006	64	7.81%	7.81%	35.94%	40.63%	6.25%	1.56%
2007	64	6.25%	12.50%	39.06%	35.94%	4.69%	1.56%
2008	64	7.81%	6.25%	40.63%	43.75%	1.56%	0.00%
2009	64	7.81%	14.06%	32.81%	42.19%	3.13%	0.00%
2010	64	4.69%	12.50%	34.38%	45.31%	3.13%	0.00%
2011	58	5.17%	13.79%	37.93%	37.93%	5.17%	0.00%
2012	54	3.70%	16.67%	38.89%	29.63%	11.11%	0.00%

We make the distinction between financial and non-financial firms because of their substantial diversity in the size and structure of their financial statement and Deferred Tax Positions. In the banking sector, from the year 2005 to 2011, the vast majority of firms reports DTAs, which as a percentage is less than 3% of their Assets. In 2011 we have absolute prevalence of Deferred Asset Positions, while in 2012 there has been a significant displacement of one third (1/3) of the firms to the DTAs, which for the first time exceeds 3%. This is attributed to the *impairment due to significant elements of their assets (portfolios of loans, equity and securities, etc.)* as well as to the recognition of deferred tax assets due to losses of PSI, as discussed above in Table 4.

Table 5 (a): Financial Firms (Banks) - Distribution of Net Deferred Tax Positions as a Share of Firm Assets, 2005-2012.

Table 5.a: Financial Firms (Banks) - Distribution of Net Deferred Tax Positions as a Share of Firm Assets							
Year	Sample Size	Firms with Net Deferred Tax Liabilities			Firms with Net Deferred Tax Assets		
		<= -5%	-5 % to -3%	-3% to 0%	0% to 3%	3% to 5%	>= 5%
2005	14	0.00%	0.00%	14.29%	85.71%	0.00%	0.00%
2006	14	0.00%	0.00%	21.43%	78.57%	0.00%	0.00%
2007	14	0.00%	0.00%	14.29%	85.71%	0.00%	0.00%
2008	14	0.00%	0.00%	7.14%	92.86%	0.00%	0.00%
2009	14	0.00%	0.00%	7.14%	92.86%	0.00%	0.00%
2010	14	0.00%	0.00%	7.14%	92.86%	0.00%	0.00%
2011	8	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%
2012	6	0.00%	0.00%	0.00%	66.67%	33.33%	0.00%

Table 5(b): Non-Financial Firms - Distribution of Net Deferred Tax Positions as a Share of Firm Assets, 2005-2012

Year	Sample Size	Firms with Net Deferred Tax Liabilities			Firms with Net Deferred Tax Assets		
		<= -5%	-5 % to -3%	-3% to 0%	0% to 3%	3% to 5%	>=5%
2005	50	12.00%	12.00%	30.00%	36.00%	8.00%	2.00%
2006	50	10.00%	10.00%	40.00%	30.00%	8.00%	2.00%
2007	50	8.00%	16.00%	46.00%	22.00%	6.00%	2.00%
2008	50	10.00%	8.00%	50.00%	30.00%	2.00%	0.00%
2009	50	10.00%	18.00%	40.00%	28.00%	4.00%	0.00%
2010	50	6.00%	16.00%	42.00%	32.00%	4.00%	0.00%
2011	50	6.00%	16.00%	44.00%	28.00%	6.00%	0.00%
2012	48	4.17%	18.75%	43.75%	25.00%	8.33%	0.00%

On the contrary, in non-financial, it is the DTLs which prevails, covering on average 2/3 of the total Deferred Tax Positions. In addition, more than 2/3 of the firms (72%) show Positive DTAs or Negative DTLs corresponding to less than 3% of their Assets. 19% range from 3% to 5%, while about 10% that are declining exceed 5%, with the highest value -13% during the years 2011 and 2012.

The distribution of the total sample of DTPs, according to their market value gives us a completely different picture compared to the total *distribution as a percentage of the Total Assets (Table 5)*. The DTA represents on average 46% and the DTL represents 54%. Half of the firms in the sample --47%-- present DTPs, which on average exceeds 5% of their market value, with the remaining 53% being allocated to 7% for the range from 3% to 5% and 46% for the range period from 0% to 3%. This is largely a consequence of the major drop in stock prices especially after 2009 (see Table 2.c).

Table 6: Distribution of Net Deferred Tax Positions as a Share of Market Value, 2005-2012

Year	Sample Size	Firms with Net Deferred Tax Liabilities			Firms with Net Deferred Tax Assets		
		<= -5%	-5 % to -3%	-3% to 0%	0% to 3%	3% to 5%	>=5%
2005	64	23.44%	3.13%	18.75%	42.19%	6.25%	6.25%
2006	64	12.50%	6.25%	32.81%	37.50%	3.13%	7.81%
2007	64	18.75%	4.69%	34.38%	34.38%	3.13%	4.69%
2008	64	29.69%	7.81%	17.19%	21.88%	6.25%	17.19%
2009	64	28.13%	4.69%	21.88%	23.44%	4.69%	17.19%
2010	64	34.38%	1.56%	15.63%	17.19%	1.56%	29.69%
2011	58	43.10%	0.00%	13.79%	12.07%	1.72%	29.31%
2012	54	42.59%	1.85%	14.81%	11.11%	0.00%	29.63%

4 Deferred Tax Positions and the Effects of a Corporate Tax Reform

The rationale of Deferred Taxation, according to IAS 12, as well as according to US SFAS 109, is based on the Principle of comparing the value of the funds of the Balance Sheet, drawn with GAAP, and on the Tax Balance Sheet “temporary-concept”. The measurement of deferred tax positions and their presentation in the balance sheet is based on both standards in the “liability method”. This method in co-operation with the principle of “temporary concept” gives emphasis mainly on the fair presentation of the real value of assets.

The common principle to both standards is the calculation of the deferred taxation in all temporary differences. The provisions, however, and the arrangements for determining the tax rate, as well as the time the latter is put into effect, present significant differences between the two standards²⁵. The standards also vary in regards to the Accounting Treatment of the deferred tax adjustments as a consequence of changes in tax rates or tax laws and their display in the Financial Statements. According to IAS 12, in case of a change in tax rates, the differences of revaluation of the deferred tax positions mainly affect the Income Statement or the Other Comprehensive Income (OCI). However, the differences in revaluation because of the items (deferred taxes) that had been initially recognized outside the results are an exception, and follow their initial entry (e.g. through equity method). This fact, in practice, makes the process extremely complex («backwards tracing»). The SFAS 109 instead foresees that the net amount of revaluation is recorded via the Deferred Tax (income/expenses) in the period, regardless of the accounting treatment of the initial recognition. Within a joint Project with the corresponding Federal Council of the U.S.A (FASB), named “Short-term Convergence Project”, the International Accounting Standards Board (IASB) published on 31/03/2009 a draft of the revised IAS 12/Exposure Draft of a Revised IAS 12 (ED/2009/2, Income Tax).

The purpose of the Project is, in the medium term, to set aside the differences between the world’s two biggest setters of Accounting Standards. The Draft presents the intermediate outcomes of a long-term endeavor²⁶ to achieve convergence and to bridge the gap between the two most widely accepted Accounting Standards (IFRS and US GAAP). However, no remarkable progress has been attained so far²⁷. Regarding the Accounting of Income Tax, no fundamental changes are foreseen in the draft, but concerns are expressed and adjustments are proposed in order to improve the individual points of the standard IAS 12. The main changes relate to the accounting treatment of tax risks, the compulsory balance sheet classification of the deferred positions (assets-liabilities) at maturity, the calculation of the deferred taxation during the first acquisition of an asset and finally the appearance of the full impact of these tax changes in functional and other results (Intraperiod Tax Allocation)²⁸.

For these reasons, we consider that for future research, it would be interesting to approach the effects of a change in corporate tax rates in the financial statements of listed firms, based on the proposed changes to ED (2009). It is stressed that the proposed changes move very close to the reasoning and methodology of the American Standard US SFAS 109, as it was discussed in the previous paragraph regarding the convergence of the two standards. It is not the scope of this paper to discuss in this paper whether this one-time effect is likely to be perceived and utilized by Management and analysts²⁹.

The relevant Tax Reform in Greece (Law 4110/2013) includes, inter alia, an increase in corporate tax rates by six percent (6%). The timing serves largely the purposes of this research because this reform, which was tabled and began to be discussed in the appropriate committee of the Parliament at the end of 2012 and will eventually apply to profits for fiscal years beginning after 01/01/2013. In the case of Greece, the bill is considered to have come into force, after being voted for in the parliament and published in the Official Government Gazette (GG) on 23/01/2013. Deferred Taxes (DT) are calculated by multiplying the Temporary Differences between Accounting and Tax base with the statutory (or expected) Tax Rate (TR). Temporary Differences do not generally affect the net result, but only the cash flows – and, actually, in a double manner: the first time when they arise and the second time when they are smoothed out.

²⁵ See chapter 2.1 for details regarding the choice of the tax rate and the date of integration of related changes.

²⁶ Compare the ED/2009/2 IN2 regarding the progress of convergence of IAS with the United States Generally Accepted Accounting Principles.

²⁷ The effort appears to be unilateral because only the side of IASB presents related work. The other side (FASB) has not shown any substantial proposals for changes to SFAS 109.

²⁸ The publication of a standard, which will replace the current IAS 12 and incorporate the interpretations SIC 21 and SIC 25, was planned for the first half of 2011. However, because of the strong criticism on the draft, the IASB decided not to apply the changes and to review from scratch the provisions and regulations of the standard.

²⁹ See the surveys of Neubig (2006) , Mills (2006), Chen and Schoderbek (2000).

However, they affect the allocation between current tax (tax effect) and deferred tax (income or expense) in order to visualize the overall tax burden of the period.

The world's most Generally Accepted Accounting Principles (GAAP), IAS 12 & US-SFAS 109, provide a single adjustment of the deferred tax positions items (Assets-Liabilities) of the Balance Sheets to reflect changes in the tax rates. This adjustment (except for specified exceptions) is recognized by an equivalent increase/decrease of the total cost of taxes in the Accounting Period Results. Therefore, in the case of a firm where the total DTAs override the DTLs, i.e. the net deferred position is Deferred Tax Assets (DTAs), an increase in the tax rate will result in an equal increase in both Assets and Results because of the recalculation of funds of the DT. However, if the Net DTLs prevail, then an increase in the tax rate will result in increased liabilities, reduction of profitability and deterioration of the relevant indicators. It is obvious that if the tax rate declines, firstly both the assets and the Results After Tax (RAT) will decline as well, while at the second reduction of the liabilities, there will be an increase in profitability.

The limitations in our research, which will potentially lead to overestimated/underestimated magnitudes, mainly relate to the following:

Firstly, we assume that all temporary differences will be revaluated. However, items under the general description "Operating Loss & Credit Carryforwards or Tax Carryforwards" often include Tax deductions and tax-free reserves (Credit or Tax Carryforwards), which are not affected by the change in tax rates because they are deductible and are deducted after calculating the tax. Therefore, in some individual cases, due to poor or incomplete analysis in the notes, it was extremely difficult to make the necessary distinction between Net Operating Loss carry forwards and Tax Credit Carryforwards. In addition, our sample includes firms with operations in foreign countries which have items of deferred tax assets from tax losses carry forwards (NOL). Many firms, in their disclosures, do not separate the internal funds from the external ones in order for the latter not to be adjusted. Secondly, and putting into practice the changes proposed in the draft "ED/2009/2 Income Tax", which largely coincide with the methodology of the U.S. standard SFAS 109, we believe that all revaluation disputes of the deferred tax positions will affect the results of the period regardless of the accounting treatment of the initial recognition.

The tables below present the potential impact of the revaluation of deferred tax positions of the sample firms on net income, with a "backwards tracing" example in which the statutory tax rate is set at 26% for all the firm-years from 2006 to 2012. Given the fact that our sample includes firms which vary considerably in terms of sector as well as financial and capital structure, the presentation includes two categories (financial and non-financial). During the test period (2004-2012), the statutory tax rate showed significant variations, which allows us to make comparisons over time and sensitivity analyses in a fairly representative and stable over time sample. We believe that both the adoption and the application of the rate of 26% will be applied in the preparation of financial statements at the end of each period and thus we revalue the Deferred Tax Positions that existed at the beginning of the year³⁰ (Beginning of period Net DTP) and we calculate its effect on the net result of the use (*Revaluation Effect on NI*). In order to approximate the effect due to change in the tax period (current Tax) in the net result (Direct Effect on NI), we use the tax rates that apply to each year.

Table 7a below illustrates on average the effect that the application of a rate of 26% for the years 2006-2012 would have on the *Net Income* of *non-financial firms* in the sample. A tax rate increase by 6 % (from 20% to 26%) in 2012 would entail a direct effect on current tax that would be on average 4.1 million €, corresponding to 17% of Net profit (23.9 million €).

If the rate change had been put into effect at the end of 2006, we would have had a reduction in the rate by 4% (from 29% to 25%) as well as in the direct effect by almost 4%. In the fiscal year during which the new (increased or decreased) Tax rate is enforced, the net result

³⁰ In case the adoption and implementation of the new rate became effective in the next year, the revalued deferred positions would be those at the end of the year. However, if we had adoption of the IAS 12 at the end of the year and implementation for the taxation in the next year, we would only calculate the effect of the revaluation.

is affected by a change (increase or decrease) of the *Direct Effect on NI*, as well as by the revaluation of deferred tax positions that existed at the beginning of the year with the new rate (reduced or increased) (Revaluation effect on NI). Even though one might expect that this effect would be of secondary importance, it is proved that in many firms this single impact on net results is quite significant and moves into double digits. According to our calculations in Table 7.a, the revaluation of adjusted net deferred tax positions that existed at the beginning of the year 2012 (Beginning of period Adjusted Net DTP) of 32.1 million €, will result in an average reduction of 6.2 million € corresponding to 26% of Net Profit for the year (23.9 million €). Therefore, for the year 2012, the overall negative effect on the results is estimated to reach 10.3 million €, corresponding to 43.3% of the average Net Profits of the year. In this case, the negative effect of revaluation corresponds to almost 3/5 of the total (*figure.1*). The sign (positive/negative) and magnitude of the effect are correlated with the amount and type of the deferred tax position of assets and liabilities at the beginning of the year.

For firms with net DTA Position (Panel b), a reduction in the tax rate would reduce the DTP of the Assets (due to revaluation at a lower rate) and equally the net income (due to increase of the DTL). This negative effect on results counterbalances the positive effect that occurs due to reduction of the current tax burden. A typical example for this is the year 2006. In case of an increase in the rate, we would have exactly the opposite effect, i.e. strengthening of the Assets and net results and increase of the current tax burden. At the beginning of the year 2012, for the 17 firms reporting an average DTA of 21.9 million €, the overall average positive effect on the results, due to the increase of 6% in the rate, is estimated at 5 million € and it is fully absorbed by the average increase in the tax burden of 5.8 million €.

Panel c presents the firms of the sample which start the fiscal year with a net DTL. An increase in the tax rate in the fiscal year 2012 from 20% to 26% would provoke, because of the revaluation (Revaluation Effect on NI), an average increase of 12.3 million € in liabilities and an equally negative effect on results, which are almost double (192.63%) of the average total net profits of 6.4 million €. If the effect of the average burden of this tax, 3.2 million € (Direct Effect on NI), is not taken into account, the overall negative impact reaches 15.6 million €, corresponding to 243% of the mean Net Income for this year.

Table 7(a): Non-Financial Firms -Mean Impact of Federal Statutory Rate (Increase/Decrease) to 26%

Table 7a : Non- Financial Firms - Mean Impact of Federal Statutory Rate (Increase/Decrease) to 26% (€' 000)									
<i>Panel A: All Firms</i>									
Fiscal Year	Number of Firms	Mean Pre-tax Income	Mean Net Income (NI)	Beginning of period Adjusted Net DTP	Revaluation Effect on NI	Period Statutory Tax Expense	Direct Effect on NI	Total Effect on NI	Period Statutory Tax Rate
2005									32.0%
2006	50	97,000	69,530	-13,464	2,825	-26,615	2,753	5,578	29.0%
2007	50	120,030	89,206	-17,453	1,737	-27,986	-1,119	618	25.0%
2008	50	61,380	44,828	-23,838	-917	-22,793	-912	-1,829	25.0%
2009	50	92,362	57,904	-19,053	-752	-22,169	-887	-1,639	25.0%
2010	50	45,069	17,059	-29,180	-1,089	-23,622	-1,969	-3,057	24.0%
2011	50	1,163	-1,406	-33,476	-2,141	-14,034	-4,210	-6,351	20.0%
2012	48	36,999	23,874	-32,122	-6,213	-13,733	-4,120	-10,332	20.0%
2013									26.0%
<i>Panel B: Firms with Beginning of Period Net DTA</i>									
2005									32.0%
2006	23	118,031	82,122	15,697	-3,277	-32,268	3,338	61	29.0%
2007	20	122,946	85,823	16,078	-1,599	-34,400	-1,376	-2,975	25.0%
2008	15	143,223	104,077	15,509	597	-46,941	-1,878	-1,281	25.0%
2009	16	143,568	87,678	23,253	833	-34,795	-1,392	-558	25.0%

2010	16	66,859	26,324	19,543	721	-27,324	-2,277	-1,556	24.0%
2011	18	45,889	26,497	22,008	1,425	-18,046	-5,414	-3,989	20.0%
2012	17	73,642	55,706	21,862	5,003	-19,261	-5,778	-775	20.0%
2013									26.0%
<i>Panel C: Firms with Beginning of Period Net DTL</i>									
2005									32.0%
2006	27	79,085	58,805	-38,305	8,023	-21,800	2,255	10,278	29.0%
2007	30	118,085	91,461	-39,807	3,962	-23,710	-948	3,013	25.0%
2008	35	26,305	19,436	-40,701	-1,565	-12,443	-498	-2,063	25.0%
2009	34	68,265	43,893	-38,962	-1,499	-16,227	-649	-2,148	25.0%
2010	34	34,814	12,699	-52,108	-1,941	-21,880	-1,823	-3,764	24.0%
2011	32	-23,996	-35,851	-64,686	-4,147	-11,777	-3,533	-7,680	20.0%
2012	31	16,905	6,418	-61,726	-12,363	-10,701	-3,210	-15,574	20.0%
2013									26.0%

Figure 1: Total Effect of Statutory Rate (Increase/Decrease) to 26% - (Non- Financial firms)

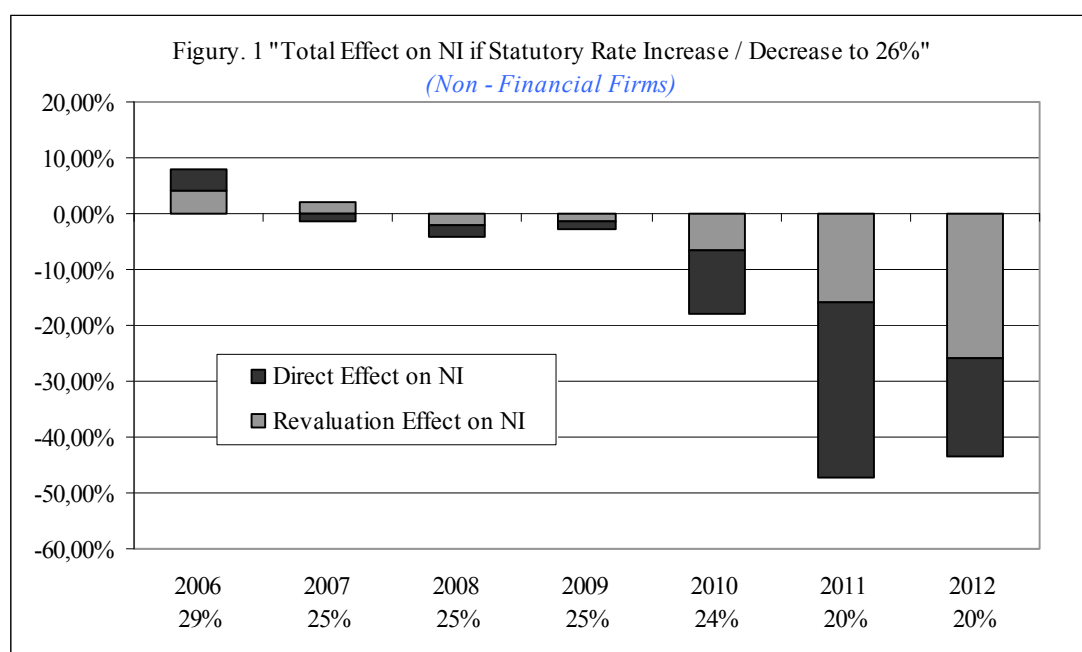


Table 7b.1 presents the details of the evolution of the firms in the banking sector. In this Table, we can easily find an enduring prevalence of the Deferred Tax Positions of the Assets, which by 2010 have averaged a steady and relatively small proportion of the assets (see table 5.b). From 2011 onwards, however, we have a massive increase in the Deferred Tax Assets, which in the year 2012 are on average 1.14 bn. A tax rate increase by 6% would result in a positive revaluation difference which would increase the Assets on average and the period results respectively by 264 million €, corresponding to 29.33% of the average loss of 2012 (figure 1). The growth rate would almost have a negligible negative effect of 1.58%, resulting in final net positive effect standing at 27.75% of the net results.

Table 7(b).1: Financial Firms - Mean Impact of Federal Statutory Rate (Increase/Decrease) to 26%

Table 7b.1: Financial Firms - Mean Impact of Federal Statutory Rate (Increase/Decrease) to 26% (€' 000)									
<i>Panel A: All Firms (Banks)</i>									
Fiscal Year	Number of Firms	Mean Pre-tax Income	Mean Net Income (NI)	Beginning of period Adjusted Net DTP	Revaluati on Effect on NI	Period Statutory Tax Expense	Direct Effect on NI	Total Effect on NI	Period Statutory Tax Rate
2005									32.0%
2006	14	295,266	217,867	75,150	-15,681	-62,496	6,465	-9,216	29.0%
2007	14	464,160	379,411	83,439	-8,583	-59,067	-2,363	-10,945	25.0%
2008	14	303,125	239,034	68,546	2,636	-51,141	-2,046	591	25.0%
2009	14	135,860	83,334	116,287	4,506	-37,953	-1,518	2,988	25.0%
2010	14	-14,334	-58,519	125,865	4,647	-41,561	-3,463	1,184	24.0%
2011	8	-4,884,847	-4,303,022	217,492	13,942	-41,349	-12,405	1,537	20.0%
2012	6	-1,090,898	-898,772	1,142,317	263,612	-47,260	-14,178	249,434	20.0%
2013									26.0%
<i>Panel B: Firms with Beginning of Period Net DTA</i>									
2005									32.0%
2006	12	320,216	235,420	90,442	-18,873	-70,060	7,248	-11,625	29.0%
2007	11	533,450	434,771	115,691	-11,508	-69,237	-2,769	-14,277	25.0%
2008	12	327,984	256,967	88,095	3,388	-57,324	-2,293	1,095	25.0%
2009	13	129,558	76,639	128,540	4,962	-39,514	-1,581	3,382	25.0%
2010	13	-24,257	-69,884	139,040	5,134	-42,042	-3,503	1,630	24.0%
2011	7	-4,996,856	-4,396,839	249,946	16,022	-43,628	-13,088	2,934	20.0%
2012	6	-1,090,898	-898,772	1,142,317	263,612	-47,260	-14,178	249,434	20.0%
2013									26.0%
<i>Panel C: Firms with Beginning of Period Net DTL</i>									
2005									32.0%
2006	2	145,568	112,551	-16,599	3,471	-17,115	1,770	5,242	29.0%
2007	3	210,095	176,424	-34,821	2,143	-21,778	-871	1,272	25.0%
2008	2	153,968	131,438	-48,747	-1,875	-14,044	-562	-2,437	25.0%
2009	1	217,797	170,379	-43,000	-1,422	-17,669	-707	-2,129	25.0%
2010	1	114,674	89,228	-45,417	-1,677	-35,311	-2,943	-4,620	24.0%
2011	1	-4,100,784	-3,646,302	-9,684	-621	-25,396	-7,619	-8,240	20.0%
2012									20.0%
2013									26.0%

Figure 2: Total Effect of Statutory Rate (Increase/Decrease) to 26% - (*Financial firms*)

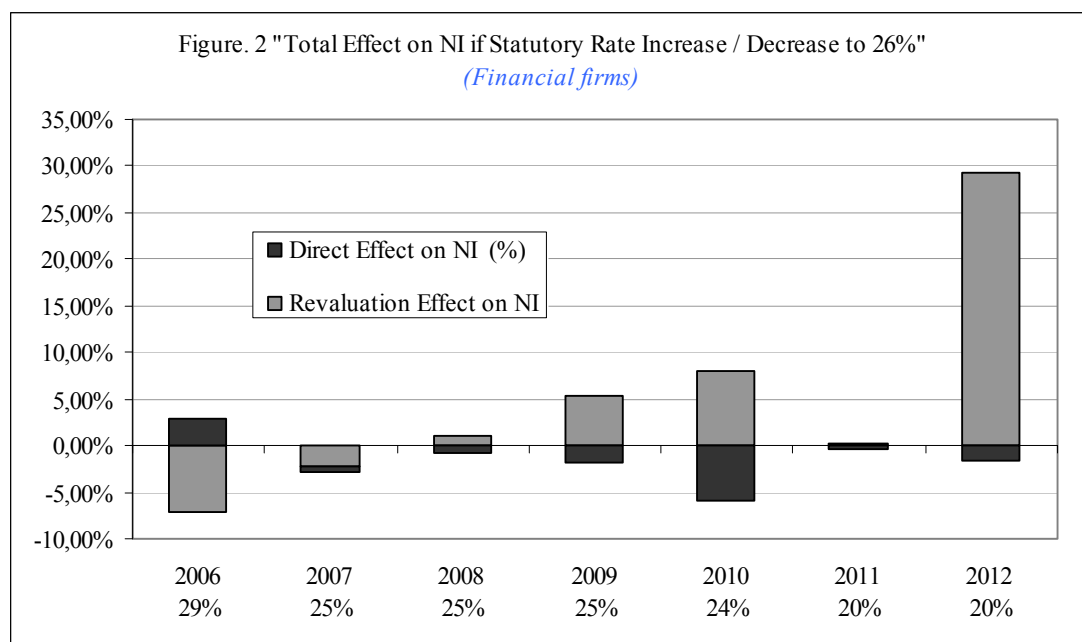


Table 7.b.2 presents separately the banking industry for the year 2012 because of the great importance of the sizes of the deferred tax positions and the forthcoming recapitalization. At the end of 2012 all listed financial firms show Deferred Tax Assets of nearly 6.7 billion €, representing 2.2% of Total Assets (307 billion) and 184 % of their (negative) total Equity (3.63 billion). We estimate that an increase in the tax rate on corporate profits by 6% would increase the Assets and the period results respectively by 1.50 billion €, corresponding to 27.75% of the reported Net Income (loss) of 2012.

Table 7(b).2: Impact of Federal Statutory Rate Increase from 20% to 26% (fiscal year 2012)

Table 7 (b).2: Impact of Federal Statutory Rate Increase from 20% to 26% , (€' 000)								
Panel A: All Financial firms (Banks)								
Year	Banks	Aggregate Pre-tax Income	Aggregate Net Income (NI)	Aggregate Beginning of period Net DTA	Revaluation Effect on NI	Period Statutory Tax Expense	Direct Effect on NI	Total Effect on NI
2012	ALPHA BANK	-1,344,863	-1,085,870	1,437,775	331,794	-28,831	-8,649	323,145
	EUROBANK	-1,688,000	-1,354,000	2,220,400	512,400	-43,000	-12,900	499,500
	ATTICA BANK	-192,019	-181,599	43,783	10,104	-3,331	-999	9,104
	GENERAL BANK	-149,204	-105,232	60,169	13,885	4,668	1,400	15,286
	NAT. BANK OF GR	-1,985,937	-2,143,666	1,621,016	374,081	-200,520	-60,156	313,925
	PIRAEUS BANK	-1,185,367	-522,264	1,470,758	339,406	-12,547	-3,764	335,642
	Total	-6,545,390	-5,392,631	6,853,900	1,581,669	-283,561	-85,068	1,496,601

The table below summarizes all the firms of the sample, and separates the firms by exhibiting DTA or DTL Positions at the beginning of the year. Here, we observe a clear contribution of the Deferred Tax Asset Positions of the Banks in the increase of DTA. However, the image of DTL remains essentially unaffected.

Table 7: Total sample (Financial and Non- Financial) - Mean Impact of Federal Statutory Rate (Increase/Decrease) to 26% (€)

Table 7: Total sample (Financial and Non- Financial) - Mean Impact of Federal Statutory Rate (Increase/Decrease) to 26% (€' 000)									
<i>Panel A: All Firms (Financial and Non - Financial)</i>									
Fiscal Year	Number of Firms	Mean Pre-tax Income	Mean Net Income (NI)	Beginning of period Adjusted Net DTP	Revaluation Effect on NI	Period Statutory Tax Expense	Direct Effect on NI	Total Effect on NI	Period Statutory Tax Rate
2005									32.0%
2006	64	140,371	101,979	5,920	-1,223	-34,464	3,565	2,342	29.0%
2007	64	195,308	152,688	4,617	-520	-34,785	-1,391	-1,911	25.0%
2008	64	114,262	87,311	-3,629	-140	-28,994	-1,160	-1,299	25.0%
2009	64	101,877	63,467	10,553	398	-25,622	-1,025	-627	25.0%
2010	64	32,074	527	4,736	166	-27,546	-2,296	-2,130	24.0%
2011	58	-672,770	-605,077	1,140	77	-17,802	-5,340	-5,263	20.0%
2012	54	-88,323	-78,642	98,371	23,768	-17,458	-5,237	18,530	20.0%
2013									26.0%
<i>Panel B: Firms with Beginning of Period Net DTA</i>									
2005									32.0%
2006	35	187,351	134,681	41,324	-8,624	-45,225	4,678	-3,946	29.0%
2007	31	268,609	209,644	51,425	-5,115	-46,761	-1,870	-6,986	25.0%
2008	27	225,339	172,028	47,770	1,837	-51,556	-2,062	-225	25.0%
2009	29	137,287	82,729	70,451	2,684	-36,910	-1,476	1,208	25.0%
2010	29	26,014	-16,804	73,111	2,699	-33,922	-2,827	-127	24.0%
2011	25	-1,366,080	-1,212,037	85,831	5,512	-25,209	-7,563	-2,051	20.0%
2012	23	-230,151	-193,289	314,155	72,466	-26,565	-7,969	64,497	20.0%
2013									26.0%
<i>Panel C: Firms with Beginning of Period Net DTL</i>									
2005									32.0%
2006	29	83,670	62,511	-36,808	7,709	-21,477	2,222	9,931	29.0%
2007	33	126,450	99,184	-39,354	3,797	-23,534	-941	2,855	25.0%
2008	37	33,205	25,490	-41,136	-1,582	-12,530	-501	-2,083	25.0%
2009	35	72,538	47,507	-39,077	-1,496	-16,268	-651	-2,147	25.0%
2010	35	37,096	14,886	-51,917	-1,933	-22,264	-1,855	-3,788	24.0%
2011	33	-147,535	-145,258	-63,019	-4,040	-12,190	-3,657	-7,697	20.0%
2012	31	16,905	6,418	-61,726	-12,363	-10,701	-3,210	-15,574	20.0%
2013									26.0%

5. Summary & Conclusion

This paper aims to highlight the role and importance of Deferred Tax Positions and the impact of a change in tax rates in a sample of financial and non-financial firms listed in the Athens Stock Exchange that covers the years 2005-2012.

Significant divergences are observed, from year to year, of values and trends of the temporary differences, as share in (%) of the gap between “*Reported and Taxable Income*”. In the Banking Sector from 2009 onwards, Book Profits are less than Taxable profits, while in fiscal year 2011 book losses of 39 billion are recorded, with 31.5 billion resulting from the haircut of GGBs (PSI). A significant part of these losses, 21.7 billion, was classified as NOLs Carry Forwards with the corresponding Deferred Tax being recognized as receivable (Asset). These items are indirectly correlated with profitability, their capital adequacy and the amount of future cash flows for tax payment. In both of these categories of

firms, the temporary differences are responsible for approximately half of the Book-Tax Profit divergence.

At the end of 2012, the majority of the firms in the sample exhibit DTL. The DTA of the minority is more than five times bigger. The overall increase of DTAs, in this period, amounted to 477%. Two thirds of non-financial firms report DTLs which is four times higher than the DTLs of the remaining one third. All of the financial firms report DTAs equivalent to 2.17% of their assets and 184% of their (negative) equity.

In non-financial firms, DTLs are prevalent, with the most significant components arising from Property, Plant & Equipment (PPE), investments in subsidiaries and Mark-to-market adjustments of Properties. DTAs arise primarily from Employee Benefits, Construction Contracts, and NOLs carry forwards. In contrast, as regards financial firms (Banks), it is the DTAs that are prevalent. DTAs from NOLs Carryforwards cover on average 87% of the Deferred Positions. At this point, reasonable questions arise as to whether banks will be able to show profitability in order to offset these assets with future tax liabilities. Otherwise, they are obliged to write down the total amount of assets not susceptible to offsetting. Diachronically, "Employee Benefits" is the most important source of Deferred Tax Assets, while Deferred Tax Liabilities arise mainly from Book-Tax depreciation differences related to Property, Plant & Equipment (PPE). *The result is consistent with the Poterba (2011) study.*

According to the distribution of Deferred Tax Positions, based on the firms' Market Value, DTAs represent on average 46% and DTLs 54% of their total capitalization. As far as the distribution the Deferred Tax Positions is concerned, based on their Assets, in non-financial firms, DTLs represent the larger part, covering on average 2/3 of the total Deferred Tax Positions. In financial firms, from 2011 onwards, we observe only Deferred Asset Positions.

We estimate that a tax rate increase by 6%, applicable at the end of 2012, would significantly favor firms with DTAs, by strengthening their Assets and Net Income, while in contrast it would negatively affect the Net Income, and would inflate the liabilities of firms with DTLs. For firms with DTAs, the banking sector claims the lion's share, having enhanced Net Income and Assets to more than ¼ of the industry's total losses at the end of 2012. In contrast, firms with DTLs (the majority) will experience a significant decline (243%) in their net income with the industry sector being most severely affected. The variation in the "short-run" revaluations effect, arising from the heterogeneous deferred tax positions across the sectors, could lead to reactions and incentives for or against a tax reform that focuses on the increase or decrease of corporate tax rates.

Based on the above, we believe that the quantitative and qualitative characteristics of the Deferred Tax Positions and Deferred Taxes should be taken seriously into account and evaluated accordingly by all users of the Financial Statements and Reports (investors, analysts, lenders, capital markets, regulatory and supervisory authorities). All parties involved, each for their purpose, will probably need to revise the data and models used, as far as the estimates of future earnings, the efficiency of capital invested and the calculation of risks linked with the financial and capital structure of corporations are concerned. It would also be useful to further explore the possibility of tax and supervisory authorities to utilize the tax notes and disclosures during the tax audit in order to track tax evasion or the shift of taxable income from year to year, to create models able to predict the firms' ability to pay taxes and finally to simplify the process and reduce the cost of revenue collection

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Appendix A: Sample Firms' Years and characteristics

The following 64 firms are included in our sample during the period 2005 to 2012³¹

a. Non – Financial Firms

AEGEAN AIRLINES S.A., ALAPIS S.A, ATHENS WATER SUPPLY & SEWAGE Co., ATHENS MEDICAL C.S.A., BABIS VOVOS INTERNATIONAL TECHNICAL S.A., CENTRIC HOLDINGS S.A., CORINTH PIPEWORKS S.A., COCA-COLA HBC AG., DIAS AQUACULTURE S.A., ELINOIL S.A., ELLAKTOR S.A., ELVAL - HELLENIC ALUMINIUM INDUSTRY S.A., EUROBANK PROPERTIES REIC., FLEXOPACK S.A. FOLLI FOLLIE S.A., Forthnet S.A., FOURLIS S.A., FRIGOGLASS S.A.I.C., GENERAL BANK OF GREECE S.A., GR. SARANTIS S.A., GREEK ORGANISATION OF FOOTBALL PROGNOSTICS S.A., HALCOR S.A (FORMER VECTOR), HELLENIC TELECOM. ORG., HELLENIC PETROLEUM S.A., I. KLOUKINAS - I.LAPPAS S.A.CONSTR. AND COM.COMP., INTRALOT S.A., INTRACOM S.A. HOLDINGS., J. & P. - AVAX S.A., JUMBO S.A., KLEEMANN HELLAS S.A., LAMBRAKIS PRESS., LAMDA DEVELOPMENT S.A., LAVIPHARM S.A., METKA S.A., MICHANIKI S.A., MOTOR OIL (HELLAS) CORINTH REFINERIES SA., MYTILINEOS HOLDINGS S.A., NIREUS S.A., PIRAEUS PORT AUTHORITY SA., PUBLIC POWER CORPORATION SA, QUEST HOLDINGS S.A., SELONDA AQUACULTURE S.A., SIDENOR S.A. (FORMER ERLIKON), SPRIDER STORES S.A., TECHNICAL OLYMPIC S.A., TERNA ENERGY S.A., TITAN CEMENT COMPANY S.A., THESSALONIKI PORT AUTHORITY S.A., THESSALONIKI WATER AND SEWAGE COMPANY SA., VIOHALKO S.A.

b. Financial Firms

ALPHA BANK A.E., AGRICULTURAL BANK OF GREECE S.A., ATTICA BANK S.A., BANK OF CYPRUS PUBLIC COMPANY LTD. , CYPRUS POPULAR BANK PUBLIC CO LTD (2011) 32* , MARFIN POPULAR BANK (2010) * , MARFIN EGNATIA BANK (2009) * , EMPORIKI BANK OF GREECE S.A. EUROBANK ERGASIAS S.A., GENERAL BANK OF GREECE S.A., NAT. BANK OF GREECE SA , PIRAEUS BANK S.A., PROTON BANK S.A., T BANK S.A., TT HELLENIC POSTBANK S.A.,

³¹ The Firms (MIG, HELEX, KAE) are not included in our sample

³² (*) On December, 2009 the Extraordinary General Meetings of the two Banks approved the merger through the absorption of Marfin Egnatia Bank S.A. by Marfin Popular Bank Public Co Ltd. On December, 2012 Marfin Popular Bank Public Co Ltd was renamed to CYPRUS POPULAR BANK PUBLIC CO LTD.

Indices Composition and share of firm's capitalization in the sample

ASE / Indices	Number of Firms	Capitalization (%)	Firms	Capitalization (%)	Firms	Capitalization (%)	Firms	Capitalization (%)	Firms	Capitalization (%)	Firms	Capitalization (%)	Firms	Capitalization (%)	Firms	Capitalization (%)
	2005		2006		2007		2008		2009		2010		2011		2012	
FTSE/ASE 20	16	75%	18	79%	19	82%	19	84%	19	81%	19	84%	18	86%	22	88%
FTSE/ASE Mid 40	23	10%	24	11%	28	12%	30	11%	28	14%	19	11%	25	10%	12	7%
FTSE/ASE Small Cap 80	11	1%	12	2%	7	3%	8	4%	13	2%	19	2%	2	0%	0	0%
FTSEA, FTSE/GT, FTSE/MSFW	8	3%	6	1%	10	2%	6	1%	3	3%	7	3%	10	4%	15	6%
Temporarily not included ³³	6	11%	4	7%	0	0%	1	0%	1	0%	0	0%	3	0%	5	0%
TOTAL	64	100%	64	100%	64	100%	64	100%	64	100%	64	100%	58	100%	54	100%

³³ The banks: Marfin (EGNAK), TBANK and TEMP are not included in the ASE indices because they are traded under the Low Dispersion & Specific Features Category

