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CORPORATE INCOME TAX COMPLIANCE COSTS AND THEIR DETERMINANTS: EVIDENCE FROM GREECE

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ABSTRACT

This paper examines the corporate income tax compliance costs and their determinants by analyzing survey and financial statements data from firms operating in Greece. We find that corporate tax compliance costs are of considerable size and vary with several firm-specific characteristics, including the firm's size, its age, the sector in which it operates, its location and its legal form. The paper intends to raise awareness regarding the impact of tax compliance costs, especially for countries, such as Greece, that were significantly affected by the economic and financial crisis.

Keywords: corporate taxes; compliance costs; Greece

JEL classification: H25; M21

1. INTRODUCTION

The tax system is a set of laws, decrees, directives and administrative procedures that regulate the imposition of taxes in the economy. Corporate taxes are recognized as the direct financial cost of the tax system to firms. However, is this cost the only cost borne by firms in the context of the tax system?

The short answer is no. Regulation has a number of consequences for firms, apart from the direct financial costs, which include the tax compliance costs as well as the efficiency costs of taxation. Tax compliance costs, that is, the costs incurred by firms in meeting the tax law requirements over and above the actual payment of tax (Sandford, 1995), are usually ignored and only rarely quantified.

In this study, we seek to measure the tax compliance costs incurred by firms in Greece to comply with their most important tax obligation, the submission of their income tax return. Moreover, we examine the determinants of the corporate income tax compliance costs focusing on the way they vary across specific firm characteristics.

This paper intends to raise awareness regarding the impact of tax compliance costs, especially for countries, such as Greece, that were significantly affected by the economic and financial crisis. It contributes to the existing empirical research in manifold ways. Firstly, this is the only empirical study that has ever examined income tax compliance costs in Greece. Secondly, it is one of the very few studies worldwide (and the first, to the best of our knowledge, outside North America) examining the determinants of the corporate income tax compliance costs. Moreover, it emphasizes on the determinants of four distinct components of these costs (internal costs, external costs, educational costs, acquisition costs) in an analysis that has never been performed in such level of disaggregation before. Finally, this study builds on a widely applied methodology for determining the burdens of regulation for businesses; the methodology of 'Standard Cost Model' (SCM Network, 2005). We exploit the advantages of this methodology (e.g., high degree of detail, standardized measurement method) and we extend it by using a more solid statistical approach, both in terms of sampling procedure and in-depth analysis of the results.

The remainder of the paper is organized as follows. In Section 2, we review prior research on tax compliance costs. Section 3 presents the survey design and execution. In Section 4, we report and discuss the survey's results. In section 5, we proceed further to the investigation of the determinants of the corporate income tax compliance costs. Finally, Section 6 concludes by summarizing the results, presenting policy implications as well as ideas for further research.

2. LITERATURE REVIEW

The administrative burden of the tax system has attracted worldwide interest in the past. Typically, any reference to the tax compliance costs begins with Adam Smith, who was probably among the first who recognized the impact of the operating costs of the tax system. More specifically, in his fourth maxim for taxes, Smith (1776, V.2.28) states that *"every tax ought to be so contrived as both to take out and to keep out of the pockets of the people as little as possible over and above what it brings into the public treasury of the state."* He very eloquently explained that *"taxes are frequently so much more burdensome to the people than they are beneficial to the sovereign."* Taxes may expose people *"to much unnecessary trouble, vexation,* *and oppression; and though vexation is not, strictly speaking, expense, it is certainly equivalent to the expense at which every man would be willing to redeem himself from it."* (Smith, 1776, V.2.28).

Despite its obvious importance, Smith's fourth maxim was typically ignored at least until Haig's (1935) study in the USA. His work, which was the first to measure tax compliance costs, gave rise to a series of studies that took place mainly in North America (Bryden, 1961; Muller, 1963; Wicks, 1966). As public interest increased gradually, the few first limited efforts were followed by worldwide studies that employed various methodologies and focused on a wide range of taxes.

Among these studies, the work of Sandford et al. (1989) on the administrative and compliance costs of the United Kingdom Tax System can be regarded as highly influential. This study indicated that administrative and compliance costs combined amounted to a total well above £5 billion (4% of the tax revenue) and were falling disproportionately on the small firms.

A subsequent study by Collard et al. (1998) focused on the tax compliance costs on businesses of operating Pay-As-You-Earn (PAYE) and National Insurance Contributions (NIC) in the United Kingdom. They found that the total relevant compliance cost was equal to £1.32 billion, amounting to 1.3% of the corresponding tax receipts or 0.2% of the country's GDP. They also highlighted the regressiveness of the tax compliance costs as they found that smaller firms (by PAYE and NI collected) face a disproportionate compliance burden (Collard et al., 1998, p.7). Chittenden et al. (2005), in a relevant study, confirmed again the regressive nature of tax compliance costs.

Equally worthy of mention is the KPMG's study (2006) on the UK's tax system administrative burden. By applying the Standard Cost Model methodology (SCM Network, 2005), it showed that the administrative burden of UK tax regulation amounted to £5.1 billion. Of this amount, about 12% was attributed to corporate income tax. This study also highlights the regressive nature of tax compliance costs.

Several studies are also indicative of the global importance of the tax compliance cost research. For example, in their study for New Zealand, Sandford and Hasseldine (1992) concluded that the compliance costs of business taxes are extremely significant, cumulative in their impact and very regressive, falling disproportionately on smaller firms. In another study for New Zealand (Colmar Brunton, 2005), it was found that the average business was facing a combined annual tax compliance cost of $4.024. Evans et al. (1996), in Australia, proved that federal taxpayer compliance costs were $6.2 billion (1.4% of GDP or 7% of revenue yield). They also found that compliance costs were regressive, with larger businesses actually enjoying net compliance benefits rather than costs. Finally, in Canada, Erard (1997) concluded that the combined federal-provincial income and capital tax compliance burden for the top 500 non-financial corporations for the year 1995, amounted to $250 million, or about 5 percent of taxes paid.

Another indication of the importance of the tax compliance costs research is the fact that the Internal Revenue Service (IRS) of the USA has developed various models to estimate and forecast the compliance costs imposed by the tax system on taxpayers. The results are published yearly and estimate the average income tax compliance costs per taxpayer to be between $3.100 and $68.900, depending on the legal form and the size of the firm examined.[1]

In the light of the above studies, it seems to be commonplace that tax compliance costs constitute an important element of the total costs imposed by the tax system to businesses.

Despite, though, the numerous studies that measure the tax compliance costs, there is an equally important issue that has not attracted the proper attention of the researchers: the investigation of the determinants of the tax compliance costs. Tax compliance costs can be most probably considered to be related to specific characteristics, such as the firm's size. There is, though, a significant probability that this relationship may be standing in for other characteristics of firms that affect compliance costs. The only way to isolate the effect of the different firm characteristics on tax compliance costs is through a multiple regression analysis (Slemrod & Venkatesh, 2002).

In this context, only three studies appear to have investigated the determinants of the corporate income tax compliance costs. Specifically, Slemrod and Blumenthal (1996) explored the determinants of income tax compliance costs for the largest corporations in the United States and concluded, among others, that compliance costs rise with firm size, but they do so less than proportionately. They further found that the sector in which the company operates in and the extent of its activities are independent determinants of income tax compliance costs. In a subsequent study, Slemrod and Venkatesh (2002) confirmed this positive statistically significant association between firm size and tax compliance costs. They also discovered that being a publicly held company increases income tax compliance costs, which is also the case for firms operating worldwide. On the other hand, they found no statistically significant relationship between compliance costs and the sector in which the firm operates or the type of tax form to be completed. Erard (1997), using a sample of Canadian Big Business, also confirmed that tax compliance costs increase with size. Moreover, he proved that the number of members of a

[1] The data refer to the burden incurred to fill the U.S. Corporation Income Tax Return of 2015. For more details, visit: https://www.irs.gov/pub/irs-pdf/i1120.pdf

corporate group is positively related with compliance costs. It is additionally noteworthy that other than the mining, oil and gas industry, there was no significant difference in compliance costs across industries.

Similar studies have also been conducted examining other tax compliance costs determinants (Blumenthal & Slemrod, 1995; Gunz et al., 1996; Hudson & Godwin, 2000; Handsford et al., 2003). We will not dwell on these studies as they focus on legislations (e.g., Value Added Tax, "Pay As you Earn" system etc.) that differ considerably from the corporate income tax legislation which is the subject of this paper.

In conclusion, as Evans (2003) states, studies in the tax compliance cost field have examined most of the different types of tax and most of the different types of taxpayers. They have employed various research methodologies with varying results. More specifically, most of the studies focus on personal and corporate income taxation. Survey with the use of questionnaires is the most widely used methodology, although different approaches have been suggested and used.[2] Their findings show that tax compliance costs range from 2% to 10% of the revenue yield from those taxes; up to 2.5% of GDP; and are usually a multiple of administrative costs. With regards to the determinants of the corporate tax compliance costs, there exists a convergence between researchers, at least, about the variables that are most frequently examined; the firm size, the number of employees, age, legal form, extent of activities, extent of foreign operations, location, type of accounting software used as well as legislation-related factors are the most common variables examined in the literature.

3. SURVEY DESIGN AND EXECUTION

3.1 Research Objectives

The Greek tax system is commonly identified as one of the biggest obstacles to entrepreneurship in Greece; a criticism that is founded not only on its corporate tax rates but also on the compliance costs that the firms incur due to its complexity. This complexity stems from the length of the tax legislation, the dispersed provisions of tax law, the ambiguity of tax law interpretation and the frequent changes of tax regulation. The criticism to the Greek tax system has been recorded in various studies. For example, in Deloitte's (2014) European research report, the vast majority of the respondents (92.3%) stress that their greatest challenge was the tax uncertainty around the future of the tax system. In this context, we seek to examine the hidden

[2] For example, Godwin (1978) refers to the time and motion study techniques of Matthews (1956) and Yocum (1961).

costs of the Greek tax system by quantifying the tax compliance costs incurred by firms in Greece during the tax year 2013 so as to comply with their most important tax obligation: the submission of their income tax return. Moreover, we examine the determinants of the corporate income tax compliance costs focusing on how they vary across specific firm characteristics.

3.2. Methodology

The tax compliance procedure can become an obstacle to business productivity and, consequently, to the competitiveness of the economy. In this context, the European Commission, in an attempt to ensure that legislation "delivers the results intended by policy makers in the most efficient and effective way" (EC, 2016, p. 4), has undertaken various initiatives to improve legislation and its implementation in the context of the European Union.

The common denominator of all these initiatives is the Standard Cost Model methodology (SCM Network, 2005). The Standard Cost Model (SCM) is a method for determining the administrative burdens for businesses imposed by regulation. Its main advantage is that it uses a high degree of detail in the measurement of the administrative costs, splitting regulation into information obligations and information obligations into administrative activities. More specifically, at the core of this methodology lies the idea of information obligation, that is, the obligation arising from regulation to provide information and data to the public sector or third parties. Every information obligation is further divided into administrative activities that businesses have to carry out in order to comply with regulation. The identification of administrative activities is based on 16 standard activities, proposed by the SCM international manuals. For each administrative activity, a number of cost parameters need to be collected, including the amount of time required to complete the activity as well as its price (published official wage costs plus overhead costs). The combination of these parameters allows researchers to estimate the cumulative cost of complying with the information obligation.

The unit of measurement of the SCM analysis is the normally efficient business. A normally efficient business, according to the methodology's guideline, is the business that handles the compliance procedure in a normal manner (neither better nor worse than may be reasonably expected). The normally efficient business is identified by conducting interviews with at least three typical businesses in the target group until consistency in the answers is achieved. However, this identification process sometimes comes under criticism. In particular, it has been already suggested that the way the normally efficient business is determined does not follow a sound statistical procedure (Weigel, 2008; Cavallo et al., 2009; Torriti, 2009; Coletti &

Radaelli, 2013). On the contrary, the whole idea seems to be based on inadequate statistical samples with no guidance on how to handle extreme values. As a result, this blurred concept gives researchers too much freedom, making the entire process of doubtful scientific value.

In view of all the above, we decided to replace the idea of the normally efficient business with the 'statistical mean business', especially given the fact that the present study aims at quantifying the corporate income tax compliance costs actually incurred by firms and not the ones that legislation cause to an arbitrarily chosen firm. Moreover, by this approach, we take into account, not only the legislative environment but also the specific firm characteristics (e.g., management skills, use of appropriate software etc.) that may cause variations in the income tax compliance costs.

3.3. Questionnaire Design

The quantification of income tax compliance costs requires data collection from a sample of firms. To this end, a questionnaire was developed following previous studies in the field. The questionnaire was divided into four sections. The first section contained questions about the respondent's firm. In this section, we seek to gather data about the firm's turnover, its total assets, its number of employees and its type of accounting system and software used in the tax compliance procedure. The second section included questions about the time consumed and the cost incurred by the firm so as to comply with the obligation of the submission of income tax return. All types of compliance costs borne were examined in this part of the questionnaire, that is, internal costs, the cost of external advisors, educational costs and acquisition costs (that is, expenditures for products and services relevant to the tax compliance procedure). The third section focused on the respondents' view of the Greek tax system. In particular, respondents were asked to specify their level of agreement on a series of questions about the benefits and the psychic costs of tax compliance as well as the way the tax legislation is implemented in Greece. Moreover, they were asked to provide ideas for reducing the firm's burden in the tax compliance procedure.[3] Finally, the fourth section was designed to collect demographic data of the respondents (position, education, and level of accounting knowledge).

Given the various advantages of the online survey research (see in detail Wright, 2005), we decided to conduct the survey online. In this context, the questionnaire was administered electronically via the Qualtrics Research Suite. This approach allowed us to take advantage of

[3] The results of the third section are not presented in this paper (they are available, though, upon request by the authors).

various features such as, among others, the numerous question types, the skip logic feature (that is, omitting questions based on the respondents' previous answers) and the real – time reporting.

3.4. Sampling

The use of a representative sample was considered of exceptional importance for the validity of the results obtained. To this end, the sampling procedure was designed in cooperation with the Hellenic Statistical Authority. The sampling units were selected taking into account the distribution of firms in the population regarding their location, their sector, and their size category. It should be mentioned that only public limited liability companies (AE) and limited liability companies (EPE) were included in the sample. These firms are obliged to publish their financial statements (e.g., balance sheet, profit and loss account) allowing us to explore further the collected data. In this context, a random sample of 1,021 firms was originally selected.

3.5. Questionnaire Distribution

After completing the sampling procedure, we moved to the questionnaire distribution stage. First of all, we had to ensure that the sample firms' contact details were updated. For this purpose, we designed a telephone campaign in cooperation with a call center service provider in Greece. This partnership allowed us, on the one hand, to collect the e-mail of the person responsible for the tax compliance procedure, and, on the other hand, to communicate the research goals. The campaign lasted for three days. A total of 641 phone calls were successfully made (about 63% of the total sample) while 85% of them reacted positively to our representatives.

In an attempt to enhance the research's credibility, we also created a dedicated website with comprehensive information on the research we were conducting. The website is available in Greek at http://www.taxcompliance.gr.

We proceeded to the distribution of the questionnaire a week after the income tax return submission deadline. To this end, we designed an e-mail invitation that included an introductory note about our research, a direct hyperlink to the questionnaire and the researchers' contact details. We also created an e-mail reminder that was scheduled to be sent twice -about two and three weeks - after the initial questionnaire mailing. It should be noted that the timing of the distribution was carefully chosen in order to reduce, as much as possible, the recall bias that could have distorted the respondents' estimates. We also scheduled a telephone reminder about ten days after the initial distribution of the questionnaire to encourage firms to take part in our survey and increase response rates.

3.6. Collecting Results

The survey was active from July to September 2014. A total of 285 firms completed the questionnaire resulting in a response rate of 27.91%, an amount that can be regarded as satisfactory for this type of studies (Sandford, 1995, p. 379). After a preliminary analysis, about 11 questionnaires were excluded from the sample (4% of the total collected) since the respondents provided answers (especially in the cost calculation section) that were considered inadequate for further use. The average time the respondents took to complete the questionnaire was 25 minutes and 14 seconds.

4. SURVEY DATA

4.1. Time Valuation

The implementation of the SCM methodology requires data for wage costs from external sources. For this purpose, we used published data from the Social Insurance Institute of Greece for the hourly wages of different types of employees within the firm (owners, managers, accountants, clerks, unpaid). These wage costs were subsequently increased by 25% to account for the overhead costs, i.e. costs that are related to the employees in addition to their wage costs (e.g., expenses for telephone, heating, electricity).[4] The following table summarizes the data used for the valuation of the employees' time spent to comply with the tax legislation.

[INSERT TABLE 1 AROUND HERE]

4.2. The Magnitude of Income Tax Compliance Costs

This section summarizes the survey results. Before presenting the figures, we should highlight that, based on the demographic data collected and the distribution of firms in the population regarding their size, larger firms seem to be overrepresented in the sample. We will return to this issue in the next section.

[4] The 25% increase to account for the overhead costs was based on previous SCM studies in other European countries (such as Denmark, Norway and Sweden) (SCM Network, 2005).

The survey results presented below summarize the analysis of 274 completed questionnaires. In more detail, the sample's firms average income tax compliance cost is estimated at the amount of €9,571.72. This cost ranges from €179 to €183,834 and its median price is €3,183.79. Table 2 summarizes the distribution of corporate income tax compliance costs among their four components (internal personnel costs, external costs, educational costs, acquisition costs).

[INSERT TABLE 2 AROUND HERE]

The first component of the income tax compliance costs examined was the internal personnel cost, that is, the cost incurred within the firm to comply with the income tax return obligation. To assess this cost, respondents had to estimate the time spent on various administrative activities required to comply with this particular obligation. Table 3 summarizes these estimations.

[INSERT TABLE 3 AROUND HERE]

According to Table 3, information retrieval is the most time-consuming activity in the income tax compliance procedure. It requires an average of about 17 hours per year, an amount that equals 26.73% of the total time spent within the firm. Other activities occupying considerable time are the activities involving calculations (8.83 hours), checking and correction (6.61 hours), external meetings (6.03 hours) and the familiarization with the income tax return form (4.32 hours). In contrast, activities such as the filling and the submission of the income tax return, the tax payment, as well as the storage of the supporting documents are reported to be less time consuming. This result seems reasonable as these activities are fulfilled electronically, reducing considerably the amount of time required to comply. The least time-consuming activity is the interaction with the tax authorities, a fact that can be ideally seen as an indication of a fully functional tax system or an indication of difficulties in the communication between taxpayers and the tax authority (which is most probably the case).

Exploring further how this time was spent among the different types of employees within the firm, it appears that the firms' accountants were reported to be involved to the greatest extent in the tax compliance procedure (about 67% of the total time spent) with owners/managers and other employees spending respectively 21% and 11% of the total compliance time (see Table 4).

[INSERT TABLE 4 AROUND HERE]

Proceeding further to the valuation of the time spent on these administrative activities (see Section 4.1 and Table 1), it emerges that the internal income tax compliance cost amounts to a yearly average of €926.97 for the sample's firms (9.68% of the total tax compliance cost).

An interesting conclusion that can also be reached is that the external costs, that is, the costs incurred for external service providers, is the most important component of the income tax compliance costs. Specifically, external costs were estimated to an average of €4,167.29, an amount that is equivalent to 43.54% of the sample firms' total income tax compliance costs (see Table 2). It should be noted that the external costs include the financial cost of external service providers as well as the costs borne by the firm for the collaboration of its employees with its external advisors. The latter part of the external costs, though, was estimated at only 2% of the total external costs.

Almost equally important are the acquisition costs referring to expenditures necessary to comply with the income tax return obligation. According to the respondents' answers, the sample firms' acquisition costs were estimated to an average of €3.163,19 (33.05% of the total income tax compliance costs). The main component of these costs is the cost associated with the maintenance of the software that the firm uses. This cost was estimated to an average of €2,323.17 (73.44% of the total acquisition costs). The cost of training seminars and tax website subscriptions follow, comprising a cumulative 20.62% of the total acquisition costs. Finally, firms are reported to invest less in subscriptions to tax journals and purchases of relevant books and journals. The above figures correspond to the respondents' estimate of the period's total acquisition costs, taking additionally into account the extent to which these costs were incurred for income tax purposes. Table 5 summarizes the estimates for the acquisition costs.

[INSERT TABLE 5 AROUND HERE]

Finally, educational costs constitute another important part of the income tax compliance costs. According to the respondents' answers, about 72.5 hours on average were spent on the education of the employees on income tax legislation in the year under consideration. About 68% of this time was attributed to the accountants, with owners, managers, and other employees, sharing the rest 32%. The valuation of the time spent in education (see Section 4.1 and Table 1) results in an average cost of €1,314.28 which is equivalent to 13.73% of the total income tax compliance costs incurred by the sample's firms. The above results are illustrated in Table 6.

[INSERT TABLE 6 AROUND HERE]

4.3. Population Estimates

We have already mentioned that the collected demographic data suggest that the sample representativeness might be an issue, especially as larger firms appear to be overrepresented in the sample, perhaps due to the firms that did not participate in our survey (non-response). This fact is of great importance, especially when generalizing the results to the firms' population. Given the above, and in an attempt to arrive at some population estimates from our sample, we assigned each observation a weight using the cell-weighting method (Kalton & Flores – Cervantes, 2003). The weight for each observation was defined as:

$$Wi = \frac{\text{Proportion of size category in the population}}{\text{Proportion of size category in the sample}}$$

Weights could have also been used for the location and the sector in which the firms operate, but this proved not to be possible due to data constraints. It should be highlighted, though, that the sample representativeness problem is mostly limited to the firm size factor as the population and sample rates do not vary that much in regards to the firm's sector and location. The weights assigned to each size category are summarized in Table 7.

[INSERT TABLE 7 AROUND HERE]

Based on the methodology set out above, we proceed to an estimation of the population's income tax compliance costs. More specifically, the public limited liability companies and the limited liability companies face an average cost of €5,864.46 (see Table 8). Taking into account that there were 57.096 firms at the reference period, it emerges that the total income tax compliance costs for these firms amount to €334,837,208.16. This amount equals to 0.19% of the year's GDP or 12.61% of the total revenue collected from the corporate income tax.

[INSERT TABLE 8 AROUND HERE]

As demonstrated by the figures above, the weighting procedure resulted in a downward adjustment of the sample's income tax compliance costs, an adjustment that can be considered justified, bearing in mind the overrepresentation of large firms in the sample. It can be stated, nevertheless, that, even after this adjustment, the total compliance cost can be considered important, especially taking into account that the income tax compliance costs are not the only compliance costs that a firm has to incur in the context of the tax system.

5. THE DETERMINANTS OF THE CORPORATE INCOME TAX COMPLIANCE COSTS

Quantifying compliance costs is an important issue. However, how these costs differ among various firm characteristics? In this section, we proceed further to the investigation of the determinants of the corporate income tax compliance costs.

The preceding analysis was performed on the primary data collected from the survey conducted. To analyze further the determinants of the tax compliance costs, we enriched our dataset retrieving financial statements data for our sample firms. The data were collected from the ICAP Databank, the largest company database in Southeast Europe. Firms, for which it was not possible to obtain further data, were eliminated from the sample, resulting in a final sample of 207 firms.

5.1. Development of Hypotheses

On the basis of the literature review presented in section 2, we develop the following nine hypotheses.

Firstly, the firm size is expected to have an effect on the income tax compliance costs. This hypothesis is based, at first, on the fact that large firms require more extensive record keeping as well as an optimal coordination of their resources, a fact that may lead to increased compliance costs. At the same time, as the firm size increases, the firm is more likely to invest in high fixed-costs solutions such as the acquisition of appropriate software or the partnership with specialized tax consulting firms. These solutions are expected, on the contrary, to benefit the larger firms taking into account the significant economies of scale they may achieve. Given the above opposing arguments, it can be expected that the firm income tax compliance costs are related to firm size, although we cannot accurately predict the sign of this relationship in advance.

H1. *Corporate income tax compliance costs are related to the firm's size.*

The firm's competence to comply with the income tax law is another factor that may have an impact on compliance costs. This competence, based on previous studies (e.g., Hudson & Godwin, 2000) can be proxied by the firm's age on the assumption that the firm is expected over the years to acquire the necessary expertise and experience so as to achieve lower tax compliance costs.

H2. *Corporate income tax compliance costs are negatively related to the firm's competence to comply with the income tax law.*

The number of a firm's employees may also differentiate the firm's income tax compliance costs. More specifically, as the number of employees increases, it is reasonable to expect that the firm will hire the necessary and competent staff to comply in a more efficient way with the tax legislation, resulting, therefore, to lower compliance costs.

H3. *Corporate income tax compliance costs are negatively related to the number of employees.*

The extent of a firm's activities is expected to have an influence on the difficulty of the tax compliance procedure and, subsequently, on its income tax compliance costs. For example, a firm that has subsidiaries or branches in other countries or a firm with diverse activities incurs higher compliance costs, in comparison with a firm that operates exclusively in a single market. It is reasonable therefore that, the greater the extent of a firm's activities, the higher its income tax compliance costs.

H4. *Corporate income tax compliance costs are positively related to the extent of the firm's activities.*

Firms operating in specific sectors may be obliged to provide information that requires more intensive record keeping as well as the familiarization with more complex parts of tax legislation. For example, retailers are required to provide an accurate inventory estimate at the end of the tax year, a procedure that is in itself sufficient to increase the income tax compliance costs. On the contrary, a service-provider firm avoids that kind of costs. In the light of the above considerations, it can be expected that firms operating in different sectors may indeed face different income tax compliance costs.

H5. *Corporate income tax compliance costs are related to the sector in which the firm operates.*

Tax controls and audits may be implemented differently in a country's various geographical areas. In Greece, specifically, this seems to be the case as the number of tax audits and the revenues generated vary across different regions (General Secretariat for Public

Revenue, 2015). It can be stated therefore that a firm, depending on the region in which it operates, requires different resources and, subsequently, incurs different compliance costs so as to comply with income tax legislation.

H6. *Corporate income tax compliance costs are related to the location in which the firm operates.*

Although public limited liability companies and limited liability companies in Greece face almost identical tax law provisions, the existence of tax audit authorities that focus exclusively on public limited liability companies (the Tax Offices for public limited liability companies in the two largest cities of Greece, Athens and Thessaloniki) is expected to increase these firms' income tax compliance costs. In this context, public limited liability companies may invest more in the tax compliance procedure to ensure that they fully comply with the legislation requirements. In the view of the above, it can be therefore expected that the income tax compliance costs are related to the legal form of the firm.

H7. *Corporate income tax compliance costs are related to the legal form of the firm.*

The firm's involvement in international markets is expected to raise the level of complexity of the tax compliance procedure. It can be expected, therefore, that an export – oriented firm will incur higher income tax compliance costs, as it is obliged to comply with more complex regulations.

H8. *Corporate income tax compliance costs are positively related to the firm's exporting activities.*

Given the importance of technology in the tax compliance procedure, it can be expected that firms that use income tax return software will incur lower compliance costs than firms that comply with the legislation in a less automated way.

H9. *Corporate income tax compliance costs are negatively related to the use of income tax return software.*

5.2. Empirical Specification & Variables

To explore the association between corporate income tax compliance costs and the firm-specific characteristics, we estimate a series of four ordinary least squares (OLS) regressions for each one of the distinct components of the corporate income tax compliance costs (internal personnel cost, external service providers' cost, educational cost, acquisition cost). We apply this approach as we expect that the determinants of the income tax compliance costs will vary depending on the nature of the specific cost investigated. Consequently, the test of our hypotheses will be based on the following empirical specification:

$$\begin{aligned} ITCC_{zi} &= a_0 + a_1 SIZE_i + a_2 EMPLOYEES_i + a_3 AGE_i + a_4 ACTIVITIES_i \\ &+ a_5 LEGALFORM_i + a_6 EXPORTS_i + a_7 SOFTWARE_i + \sum_{j=1}^{q-1} a_{8j} SECTOR_{ij} \\ &+ \sum_{k=1}^{l-1} a_{9k} REGION_{ik} + \varepsilon_{it} \end{aligned} \tag{1}$$

The dependent variable (*ITCC*) is the natural logarithm of each one of the four components of the income tax compliance costs. Firm-specific variables are included in our study by proxies for firm size (*SIZE*), the number of employees (*EMPLOYEES*), the age of the firm (*AGE*) and the extent of its activities (*ACTIVITIES*). Specifically, firm size *(SIZE)* is measured as the natural logarithm of total assets. The *EMPLOYEES* variable represents the number of employees in the firm at the reference period. The firm's competence is proxied by the age of the firm, based on the assumption that 'learning by doing' increases competence (Hudson & Godwin, 2000). The extent of the firm's activities is measured by the number of unique activity codes that the firm declares to the tax authority.

Additionally, dummy variables for sectors *(SECTOR)*, location *(REGION)*, legal forms *(LEGALFORM)*, software for income tax return (*SOFTWARE*) and exporting firms *(EXPORTS)* are included in the specification to account for characteristics that may cause variation in the corporate income tax compliance costs.[5] The error term is denoted by ε_{it}. The subscripts denote the proxies used for the four components of the income tax compliance costs (z), the sector (j), the location (k) and the firm (i). Finally, q and l denote the number of sectors and the number of regions, respectively.

5.3. Results and Discussion

Table 9 presents the results of a series of multiple regressions conducted to identify the determinants of the corporate income tax compliance costs. The results are based on survey and financial statements data for a sample of 207 firms operating in Greece in 2013. The test of our hypotheses is based on equation (1).

[5] The variable *EXPORTS* is coded 1, if the firm is exporting, 0 otherwise. The variable *LEGALFORM* is coded 1 for Limited Liability Companies (EPE), 0 for Public Limited Liability Companies (AE). The variable *SOFTWARE* is coded 1, if the firm is using specialized tax software, 0 otherwise. For an overview of the variables, see Tables A1 – A3 in the Appendix.

[INSERT TABLE 9 AROUND HERE]

As indicated in the above table, the income tax compliance costs vary with specific firm characteristics such as size, age, sector, legal form, location and exporting activity. The determinants, as expected, differ among the four components of the income tax compliance costs.

More specifically, a statistically significant positive association was found between the firm size and three out of four components of the income tax compliance costs (external cost, educational cost and acquisition cost). This association, which is significant at the 1% level ($p < 0.01$) for external and acquisition cost and at the 10% level ($p<0.10$) for the educational costs, is consistent with the hypothesis **H1** and implies that the larger the firm, the higher the income tax compliance costs incurred. Given that the magnitude of the *SIZE* coefficient is significantly greater than 0 but less than 1, this finding confirms previous research (e.g., Slemrod & Blumenthal, 1996; Slemrod & Venkatesh, 2002) and implies that, although income tax compliance costs increase with firm size, they do so less than proportionately. This conclusion is of exceptional importance, especially taking into consideration that the Greek economy is almost exclusively based on small and medium-sized firms. It is remarkable that, according to Eurostat, small and medium-sized firms in Greece represent around 99.9% of all firms in the economy, accounting for 86.5% of total employment and contributing to 72.8% of the value added in the economy. [6]

With regards to the age of the firm, the results indicate that there exists a statistically significant negative association with the firm external and acquisition costs. This finding, which is significant at the 5% and 10% level, respectively, ($p < 0.05$, $p<0.10$), confirms **H2** hypothesis and the 'learning by doing' assumption, leading to the conclusion that an increase in firm age results in lower income tax compliance costs. This result can be justified on the ground that the firm creates over the years a better understanding of the legislative requirements and becomes capable of handling the tax affairs in a more efficient manner. In this context, as the firm ages, it is expected to allocate fewer resources in the tax compliance procedure resulting in lower acquisition costs. On the same basis, as the level of experience and expertise rises, the firm is expected to handle tax compliance internally reducing, therefore, the external advisors' cost.

[6] The data refer to all firms operating in Greece, irrespective of their legal form. For further details, visit the website: http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_small_and_medium-sized_enterprises#cite_note-7

Regarding the firm's legal form, the results indicate that limited liability companies incur lower acquisition costs than public limited liability companies, in agreement with **H7** hypothesis. This result, which is significant at the 5% level ($p < 0.05$), can be attributed to the increased audit probability that the public limited liability companies face in Greece (see the discussion in **H7** hypothesis). On this basis, the public limited liability companies incur higher acquisition costs in an attempt to ensure that mistakes and omissions are kept to a minimum level.

Concerning the size of the firm's staff and in agreement with hypothesis **H3**, it emerges that as the number of employees increase, the external service providers' cost decreases. This statistically significant conclusion ($p<0.10$) can be considered reasonable as a firm that invests in its people is expected to rely more on them to handle the tax compliance procedure, reducing, therefore, the external service providers' cost.

Moreover, the association between income tax compliance costs and whether the firm exports or not appears to be statistically significant ($p<0.05$) only when considering the case of acquisition costs. This finding confirms to some extent the **H8** hypothesis as the firms involved in international markets appear to invest more in products and services related to the income tax compliance procedure. Considering that these firms have to comply with more complex tax regulations, it seems to be reasonable that they invest more in order to minimize the risks of non-compliance.

Statistically significant associations with the income tax compliance costs are also found regarding the sector and the location in which a firm operates, confirming partially hypotheses **H5** and **H6**. For example, firms operating in the manufacturing sector as well as in the wholesale and retail trade sector appear to face income tax compliance costs that statistically differ from the costs incurred by firms in the reference sector (agriculture, forestry, and fishing). Similarly, the firms of specific regions of Greece (such as Sterea Ellada and Macedonia) appear to face compliance costs that statistically differ from the costs of firms operating in the reference region (Thrace).

Finally, it should be noted that the hypothesis **H9**, regarding the association between the corporate income tax compliance costs and the use of income tax return software, could not be confirmed for any component of the income tax compliance costs. The same holds for the **H4** hypothesis regarding the relationship between compliance costs and the extent of the firm's activities.

6. CONCLUSION

In this paper, we quantified the tax compliance costs incurred by firms in Greece to comply with their most important tax obligation, the submission of their income tax return. Moreover, we examined the determinants of the corporate income tax compliance costs focusing on how they vary across firm- specific characteristics.

We find that the public limited liability companies and the limited liability companies in Greece face an average cost of €5,864.46 to comply with the income tax legislation for the income tax return. By generalizing these findings to the population, it was shown that the total income tax compliance costs for those firms were estimated to €334,837,208.16, an amount that equals to 0.19% of the year's GDP or 12.61% of the total revenue collected from the corporate income tax.

Regarding the income tax compliance costs' determinants, we find that the compliance costs vary with several firm-specific characteristics. More specifically, we find that, although income tax compliance costs increase with firm size, they do so less than proportionately. Moreover, we discover that an increase in firm age results in lower income tax compliance costs, a finding that confirms the 'learning by doing' assumption and can be most probably justified on the ground that the firm becomes over the years capable of handling the tax affairs in a more efficient manner. The results also indicate that there are significant associations between income tax compliance costs and other firm characteristics, such as the number of employees, the sector in which the firm operates, the location and the legal form.

The above findings are without doubt significant. They indicate that the corporate income tax compliance costs are of considerable size, especially taking into account that these costs are not the only compliance costs that a firm faces. Moreover, they appear to fall disproportionately on smaller firms, whose contribution to employment and the added value to the economy is widely recognized. At a time when the Greek economy has the undeniable need to create a more investment-friendly environment, the recognition of the importance of tax compliance costs and the introduction of an objective aimed at the reduction of the administrative burden can become a strategic priority for policy makers. Given that the tax compliance costs represent an unnecessary waste of resources in the economy, policymakers should assess in advance their impact on businesses and take measures to ensure at least that they are kept at a minimum level. These measures can indicatively include the creation of a website that provides key information on the implementation of tax legislation, the creation of a help-desk for the interpretation of the tax laws as well as the organization of free seminars when legislative changes occur.

Moreover, this study's findings can also be used by firms to evaluate the effectiveness of their tax compliance procedure and, if necessary, to make the necessary adjustments so as to rationalize their spending. In this context, firms that incur lower tax compliance costs could serve as a reference for firms operating in the economy.

Given the importance of the tax compliance cost research, some issues can be taken into consideration in future studies. Firstly, this study could be the starting point for a thorough analysis of all tax compliance costs incurred in the context of the Greek tax system. An equally important tax legislation that needs to be investigated is the VAT legislation that contains several obligations that are expected to increase the firm's tax compliance costs significantly. Moreover, this study could be extended to the total population of firms operating in Greece, including sole proprietorships as well as general and limited partnerships. These firms make up the majority of firms' population in Greece and, given their relatively small size, are most likely expected to face a regulatory burden that can be regarded as an obstacle to entrepreneurship. Furthermore, the statistically insignificant associations that were found when investigating the determinants of the internal income tax compliance costs call definitely for further research. To this end, studies with larger statistical samples will allow researchers to explore further and identify the nature of these relationships. Finally, a comparative study in the context of the European Union can be considered of particular interest, as, although tax legislation is to some extent country-specific, a comparative analysis can strengthen our understanding of the particular characteristics of the tax systems that perform better regarding the administrative burden caused to firms. Future research can address the issues above.

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TABLES

Table 1. The Wage Costs for the Calculation of the Internal Tax Compliance Costs (in €).

Type of employee	*Average Monthly Wage*	*Average Hourly wage*	*Average Hourly Wage + Overhead costs [1]*
Managers	4,014.65	20.35	25.44
Accountants	2,699.71	14.32	17.9
Other employees	1,473.97	7.87	9.84
Unskilled employee [2]	586.08	2.93	3.66

Notes: [1] The average hourly wage is increased by 25% to account for the overhead costs, according to the SCM methodology (SCM Network, 2005). [2] The average monthly wage of the unskilled employee refers to the wage of an employee over 25 years old, with no professional experience, according to the National General Collective Agreement.

Table 2. Corporate Income Tax Compliance Costs (in €).

Income tax compliance costs	*Mean*	*Std. Dev.*	*Minimum*	*Maximum*	*% of total compliance costs*
Internal Personnel Costs	926.97	1,972.08	0	17,900.00	9.68%
External Service Providers' Costs	4,167.29	13,056.34	0	150,000.00	43.54%
Educational costs	1,314.28	3,480.44	0	45,732.50	13.73%
Acquisition costs	3,163.19	10,799.47	0	121,951.20	33.05%
Total	9,571.72	19,561.13	179	183,834.00	100.00%

Note: The data presented relate to the 274 firms of the sample under consideration.

Table 3. Time Required on Various Administrative Activities -Within the Firm- During the Compliance Procedure (in Hours).

Administrative Activity	*Mean*	*Std. Dev.*	*Minimum*	*Maximum*	*Percentage of total hours spent*
Familiarization with the income tax return form	4.32	8.38	0	50	6.76%
Information retrieval	17.07	42.00	0	350	26.73%
Calculation	8.83	38.22	0	500	13.83%
Filling the income tax return	3.34	6.36	0	50	5.23%
Checking and correction	6.61	16.34	0	100	10.35%
External meetings	6.03	21.36	0	250	9.45%
Communication with public authorities	1.54	4.18	0	30	2.41%
Submitting the income tax return	3.38	6.78	0	50	5.30%
Payment	2.86	6.46	0	30	4.47%
Storing the supporting documents	2.81	6.28	0	30	4.39%
Other	7.08	24.41	0	200	11.09%
Total	63.87	111.01	2.35	977	100%

Notes: Figures relate to the 183 firms who stated that they comply internally with income tax law and their representatives fully completed the related section of the questionnaire.

Table 4. The Allocation of Time Spent Within the Firm on the Tax Compliance Procedure Among Various Types of Employees (in % of Total Compliance Time Spent).

Type of employee	*Mean*	*Std. Dev.*	*Min*	*Max*
Owners, Managers	21.04	27.69	0	100
Accountants	67.13	33.11	0	100
Other employees	11.41	21.26	0	100
Unpaid staff	0.41	2.86	0	30

Table 5. Acquisition Costs for Corporate Income Tax Compliance Purposes (in €).

Products and services acquired for income tax purposes	*Mean*	*Std. Dev.*	*Min*	*Max*	*% of total acquisition costs*
Software maintenance package	2,323.17	9,591.31	0	121,951.20	73.44%
Subscriptions to tax websites	257.24	2,460.24	0	40,000.00	8.13%
Subscriptions to tax journals	61.71	160.65	0	1,393.61	1.95%
Purchase of relevant books, journals	58.78	174.10	0	1,800.00	1.86%
Seminars' cost	395.00	1,570.54	0	20,000.00	12.49%
Other cost	67.29	920.75	0	15,036.75	2.13%
Total acquisition costs	3,163.19	10,799.47	0	121,951.2	100%

Notes: The data presented relate to the 274 firms of the sample under consideration.

Table 6. Educational Cost Required for the Income Tax Compliance Procedure.

	Mean	*Std. Dev.*	*Min*	*Max*	
Time spent on education (in hours)	72.5	193.53	0	2500	
Time allocation to different type of employees (% of total time)					
Owners, Managers, etc.	17.79	28.49	0	100	
Accountants	68.07	35.50	0	100	
Other employees	13.75	25.92	0	100	
Unpaid staff	0.39	2.13	0	20	
	Mean	*Std. Dev.*	*Min*	*Max*	*% of total income tax compliance costs*
Total education costs to comply with income tax law (in €)	1,314.28	3,480.44	0	45,732.50	13.73%

Table 7. Calculation of Weights Assigned to Each Sample Observation.

Number of employees	*Population*		*Sample*		*Weight*
0-9	21,959	61.20%	27	9.85%	6.21
10-49	11,059	30.82%	70	25.55%	1.21
50-249	2,385	6.65%	83	30.29%	0.22
250 and above	478	1.33%	94	34.31%	0.04
Total	35,881	100.00%	274	100.00%	

Table 8. Population Estimates of Income Tax Compliance Costs

Income Tax Compliance Costs	*Weighted Average (in €)*	*% of total income tax compliance costs*
Internal Personnel Costs	595.78	10.16%
External Service Providers Costs	3,083.03	52.57%
Educational costs	1,177.92	20.09%
Acquisition costs	1,007.73	17.18%
Total	5,864.46	100%

Table 9. Multiple Regression Estimates of the Determinants of Corporate Income Tax Compliance Costs.

	Predicted Sign	*Log (Internal Personnel Cost)*	*Log (External Service Providers' Cost)*	*Log (Educational costs)*	*Log (Acquisition Costs)*
Intercept	+/-	6.0265*** (5.58)	-1.5030 (-0.62)	2.2549** (2.15)	3.3124* (1.74)
SIZE	+/-	-0.0619 (-1.12)	0.5201*** (3.59)	0.1295* (1.96)	0.2940*** (2.94)
EMPLOYEES	-	0.0001 (1.01)	-0.0010* (-1.81)	-0.0001 (-0.58)	-0.0001 (-0.23)
AGE	-	0.0067 (1.45)	-0.0383** (-2.56)	0.0010 (0.20)	-0.0124* (-1.73)
ACTIVITIES	+	0.0074 (0.83)	-0.0006 (-0.03)	0.0055 (0.53)	-0.0103 (-0.66)
LEGALFORM	+/-	0.0410 (0.06)	-0.8656 (-1.20)	0.1592 (0.794)	-1.4296** (-2.05)
EXPORTS	+/-	0.2469 (0.94)	-0.9538 (-1.30)	0.6258** (2.09)	-0.0921 (-0.23)
SOFTWARE	+/-	0. 2192 (0.266)	-0.7365 (-1.66)	-0.0597 (0.781)	-0.0480 (-0.16)
Sector 3 (Manufacturing)	+/-	0.2467 (1.08)	1.1290** (2.39)	1.9540*** (8.62)	0.9306*** (2.90)
Sector 6 (Wholesale and retail trade)	+/-	0.1070 (0.44)	1.8185*** (3.02)	1.9969*** (8.37)	0.7447** (2.06)
Region 2 (Macedonia)	+/-	0.8135 (1.27)	2.4123*** (3.43)	-0.3927 (-1.04)	-1.2778* (-1.88)
Region 4 (Sterea Ellada)	+/-	0.5025 (0.89)	2.5520*** (5.63)	-0.7472** (-2.50)	-1.3552*** (-2.70)
R^2		0.1401	0.3913	0.1563	0.2249
No. of observations		183	80	198	154

Notes: **Dependent variables**: The natural logarithm of the corporate income tax compliance costs' components (internal personnel cost, external cost, educational cost, acquisition cost) (*ITCC*). **Independent and control variables**: *SIZE, EMPLOYEES, AGE, ACTIVITIES. SIZE* is measured as the natural logarithm of total assets; *EMPLOYEES* represents the number of employees in the firm at the reference period; *AGE is the firm's age and it is used as a proxy for the firm's competence in complying with the tax law; ACTIVITIES is the number of unique activity codes that the firm declares to the tax authority.* **Categorical variables**: *SECTOR*, *REGION*, *LEGALFORM*, *EXPORTS*, *SOFTWARE*. The sectors presented in this table are the ones with the highest gross value added in the economy. The regions presented in this table are the ones that represent the most populated regions of Greece. For an overview of the variables, see Tables A1 – A3 in the Appendix. A detailed sector – location analysis is available upon request. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. *t*-statistics are reported in parentheses (robust standard errors were used). Coefficients are rounded to the fourth decimal place.

APPENDIX

Table A1. Variables.

ITCC	The natural logarithm of the corporate income tax compliance costs' components (internal personnel cost, external cost, educational cost, acquisition cost) (ITCC).
SIZE	LN (Assets)
AGE	The age of the firm
EMPLOYEES	The number of firm's employees
ACTIVITIES	The number of unique activities that the firm declares to the tax authority
SECTOR	See Table A2
REGION	See Table A3
LEGALFORM	1 for Limited Liability Companies (EPE), 0 for Public Limited Liability Companies (AE)
EXPORTS	1, if the firm is exporting, 0 otherwise
SOFTWARE	1, if the firm is using specialized tax software, 0 otherwise

Table A2. Sectors.

Sector 1	Agriculture, Forestry and Fishing
Sector 2	Mining and Quarrying
Sector 3	Manufacturing
Sector 4	Electricity, gas, steam and air conditioning supply
Sector 5	Water supply; sewerage, waste management and remediation activities
Sector 6	Wholesale and retail trade; repair of motor vehicles and motorcycles
Sector 7	Transportation and Storage
Sector 8	Accommodation and food service activities
Sector 9	Information and Communication
Sector 10	Financial and Insurance Activities
Sector 11	Real Estate Activities
Sector 12	Professional, scientific and technical activities
Sector 13	Administrative and support service activities
Sector 14	Public administration and Defence; compulsory social security
Sector 15	Human health and social work activities
Sector 16	Arts, Entertainment and Recreation
Sector 17	Other Service Activities
Sector 18	Education
Sector 20	Construction

Table A3. Regions.

Region 1	Thrace
Region 2	Macedonia
Region 3	Epirus
Region 4	Sterea Ellada
Region 5	Peloponnese
Region 6	Aegean Islands
Region 7	Ionian Islands
Region 8	Crete
Region 9	Thessaly