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## **Earnings Management in Greece: A Case Study in Construction Sector Using Jones Model**

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Ioannis Gasteratos<sup>1</sup>, Michael Karamalis<sup>2</sup>, Andreas Koutoupis<sup>3</sup>, Ioannis Filos<sup>4</sup>

**Abstract:**

*Shadow economy is harmful to the whole official economy. It distorts competition and stock prices, it worsens income distribution and is an obstacle for entrepreneurship and economic growth.*

*There are many reasons causing shadow economy. One of them is earnings management. A lot of research has been made on earnings management. In this paper Jones (1991) model will be used to examine the phenomenon of earnings management in the Greek construction industry. The findings are: first in the Greek construction sector discretionary accruals in practice affect negligibly the percentage of shadow economy in GDP, second in the Greek construction sector discretionary accruals (showing lower profits) increase in periods of higher capital tax rate, third in the Greek construction sector usually large companies resort to earnings management more than the small ones.*

*Hence, Jones (1991) model shows the way for further investigation on tax avoidance. It should be noted however that shadow economy is a very complicated topic and is not only a matter of just earnings management. The contribution of this paper is that it uses Jones (1991) model to spot tax evading companies and triggers further research.*

*Besides, the findings of this paper indicate the need for the global adoption of the international accounting and auditing standards. Cultural differentials across countries, which hinder this adoption, must be overcome.*

**Keywords:** *Shadow Economy, Earnings Management, Construction Sector, Crisis, South EU, Tax Evasion, Entrepreneurship, Perfect Competition, SMEs, Income Distribution, Economic Growth, International Accounting Standards, International Audit Standards, Panel Data Econometric Analysis, Jones (1991) model.*

**JEL classification:** *E26; E25; O17; C33*

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<sup>1</sup> Phd, University of the Aegean, Greece, [giannigaster@yahoo.gr](mailto:giannigaster@yahoo.gr)

<sup>2</sup> Phd, University of the Aegean, Greece, [michael.karamalis@gmail.com](mailto:michael.karamalis@gmail.com)

<sup>3</sup> CMIIA, CIA, CICA, CCSA, CRMA, CCS, [anreas.koutoupis@mazars.gr](mailto:anreas.koutoupis@mazars.gr)

<sup>4</sup> Associate Professor, Panteion University, Greece, [filosj@panteion.gr](mailto:filosj@panteion.gr)

## 1. Introduction

Shadow Economy is harmful to the Economy. At first it affects share prices and distorts *normal*<sup>5</sup> change in stock prices. Indeed, based on Weber (2006), analysts' systematic errors proxy for similar errors made by investors concerning book-tax differences for future earnings lead to mispricing, which destroys transparency and is *off-putting* to the would-be investors<sup>6</sup>. Further, corporate tax avoidance is positively related with firm-specific stock price crash risk (Kim et al., 2011). Besides, Georgiou (2013) asserts that shadow economy pushes up share prices.

There are countries in which a lot of firms are not *listed* in the stock market, and where *tax evasion* happens regularly. In these countries the method of *earnings management* takes place quite many times. Further, *earnings management* occurs to show that a company has reached its targets so as to increase its share price (Bartov et al., 2002). It should be also mentioned that firms aim to remain competitive<sup>7</sup> in the market and to meet their obligations to third parties (Cormier and Magnan, 1996) to avoid bankruptcy, they sometimes hide various costs, in order to avoid an increase in the interest rates of their loans<sup>8</sup>.

Besides, shadow economy distorts competition. In fact, Armbrrecht and Carlback (2011), found that it is very difficult not only to survive as a law-abiding firm, but also that the unfair competition (due to shadow economy) affects the whole sector's progress and development. In other words, shadow economy is an obstacle to the competition. Firms in a globalized environment resorted to earnings management in order to attract would-be investors<sup>9</sup> (Vanasco, 1998).

Apart from that shadow economy affects inflation and taxation. According to Mazhar and Méon (2012) in a sample of developed and developing countries during the period 1999-2007, a positive relation is found between inflation and the size of the shadow economy. Further, tax burden tends to increase shadow economy (Schneider, 2012).

Entrepreneurship is also affected by shadow economy. According to Estrin and Mickiewicz (2012) shadow economy hinders entrepreneurial entry<sup>10</sup>. In fact, freedom to enter the market is one of the fundamental rules for the creation of perfect competition (Liebhafsky, 1968). Further, shadow economy is an obstacle to

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<sup>5</sup> Changes that follow only market conditions without other interferences.

<sup>6</sup> In this way economic growth is hindered.

<sup>7</sup> This distorts perfect competition conditions as well as transparency

<sup>8</sup> This lack of transparency distorts fair competition and is an obstacle for economic growth (Georgiou, 2013a).

<sup>9</sup> This lack of transparency distorts fair competition and is an obstacle for economic growth (Georgiou, 2013a).

<sup>10</sup> This is an obstacle to perfect competition (Liebhafsky, 1968).

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entrepreneurial activity (Georgiou, 2013a) causing in this way a delay in economic growth.

Shadow economy worsens income distribution. Since, tax avoidance reduces the total tax revenues, then “tax burden” on “*honest*” tax payers are expected to go up<sup>11</sup> in order to cover the tax revenue generated gap. Consequently, this tax burden will deteriorate income distribution (Georgiou, 2013c).

Today shadow economy increases with GDP growth (Schneider & Enste, 2000). They assert that the main causes of the increase in shadow economy are the increased taxation, the rise in social security contributions, the increased regulation in the official economy, the declining loyalty towards public institutions and finally a declining tax morale. However, according to Georgiou (2016) shadow economy per head at constant prices remains fixed over time. Perhaps this difference in the conclusion is attributed to the different time span in which the research was made, or it might be since recently various imposed market regulations have restricted shadow economy.

Although shadow economy harms the official economy, countries do not seem to be willing to adopt international accounting standards and international standards of auditing to eliminate shadow economy. According to the work of ICAEW (2010) the following factors determine the quality of national environments and their effect on audited financial statements: political, economic and business environment; legal framework; education; culture; perceptions of audit. These factors hinder the adoption as well as the international harmonization in international reporting standards as well as international standards of auditing and accounting. Besides, the adoption of the above international standards requires national convergence. It would be of interest to recall Leuz (2010), who concludes: ‘the role of accounting standards is much more limited in bringing about global reporting convergence than often thought. Moving to a single set of accounting standards is not enough to produce comparability of reporting and disclosure practices, even if standards were strictly enforced in all countries. [...] true convergence in reporting practices seems far away and would require a much broader convergence of countries institutional frameworks, which is unrealistic soon (and probably not even desirable).

## 2. The Method of Earnings Management

It is worldwide claimed that the main reason of shadow economy is *tax evasion*. A comprehensive literature can be found in Schneider and Enste (2000). This global phenomenon of shadow economy appears in many types. One of them and very

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<sup>11</sup> In other words, effective tax rate will increase in order to compensate for the reduction of tax revenues, which is created by tax evasion.

common is called *earning management*, used by companies in order to pay less taxes (Guenther, 1994). This is done mainly by large companies<sup>12</sup>.

Earnings management has been analyzed by many economists DeAngelo (1986), Jones (1991), Cahan (1992) and showed a considerable increase during the period 1997-2002 (Cohen *et al.*, 2004). The rapid technological progress as well as the fast change in capital markets are two important reasons that made accounting system very complicated.

According to Allingham and Sandmo (1972), Srinivasan (1973) researches concluded that international auditing standards are one important determinant factor to reduce tax evasion. Consequently, auditing is required to guarantee that company's income statements become trustworthy. Further, Kerr (2015) asserts that countries, where companies have greater levels of transparency, experience lower levels of tax avoidance.

That is why international accounting standards as well as international auditing standards must be adopted. In this way, transparency will be increased. Consequently, an increased transparency gives better, trustworthy and reliable information to the *would-be* investors. Thus, international investments will be increased ending up with economic growth (Georgiou, 2013a). Besides, world history has shown that countries, having robust accounting systems and high levels of transparency, enjoy economic growth and political stability (Georgiou *et al.*, 2015; Rogdaki *et al.*, 2011; Bekiaris *et al.*, 2011; Tsamis and Liapis, 2014; Rovolis *et al.*, 2014).

### **3. The Greek Construction Sector**

Since economic crisis has hit mainly southern EU countries (EIOPA, 2015) and since it is claimed that tax evasion is stronger during crisis (Brondolo, 2009), it will be of interest to examine the phenomenon of *earnings management* in a Greek sector, the construction sector. It should be noted that construction sector is chosen because it used to be a very *dynamic* sector of the Greek economy. The company names are kept secret and only econometric and statistical findings will be discussed.

Economic crisis has hit Greek firms (EIOPA, 2015) and the construction sector. *Tax evasion* is higher during crisis (Brondolo, 2009). In the year 2008 in many countries a tax revenue loss started to climb reaching the 0,8% of GDP and is

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<sup>12</sup> *It is made mainly by large companies that have well organized accounting department. Hence, large companies, compared to the small and medium firms (smes), are in a position to show a better picture in order to attract investors in the future. Consequently, there is a distortion in market competition. Besides it should not be ignored that smes face also two serious problems (shortage of experienced personnel and difficult access to finance) (Hamill, 1997).*

increasing during 2009. This problem is more severe in emerging economies. On the contrary, in the EU<sup>13</sup>, regarding the companies listed in the stock exchange, (Filip and Raffournier, 2015) claim that *earnings management* has declined considerably during the 2008-2009<sup>14</sup>.

According to the Foundation for Economic & Industrial Research<sup>15</sup> (2015) the value added of the construction sector (including the related cooperating firms) was in the year 2006 the 11% of Greek GDP. The recent financial crisis reduced this percentage to 4% of GDP (2013). Furthermore, the share of employment in this sector to the total employment dropped from 13% (2008) to 8,7% (2013). It should be also noted that real estate sector was also hit by the crisis, causing a considerable drop in house prices as well as a stop in house selling. Hence, according to the data of Bank of Greece (2015) the index of production in construction sector (at fixed prices) has declined from 141,2 (2009) to 41,4 (2014).

#### 4. The Jones Model

In this chapter Jones (1991) model will be used to estimate *accruals* of the Greek construction sector (Section 4.1). After that, in section 4.2 using these estimated accruals of the above sector as a new economic variable, econometric models will be applied to *relate* these accruals with: *shadow economy* (section 4.2.a), with *capital tax rate* (section 4.2.b), and finally, in (section 4.2.c) it will be shown that *earnings management* is larger in big companies of the Greek construction sector.

##### 4.1 Estimation of accruals

At first one can estimate *discretionary accruals*, which will be estimated by model (1).

$$\mathbf{TACR}_{it} = c_0 + c_1 \mathbf{DSales}_{it} + c_2 \mathbf{FA}_{it} + \text{error}_{it} \quad (1)$$

The above model is based on the method of Jones (1991)<sup>16</sup>. Variable **TACR** equals net profits – operating cash flows. Variable **DSales<sub>t</sub>** is equal to the annual change in sales ( $\text{Sales}_t - \text{Sales}_{t-1}$ ). Variable **FA** equals Total Fixed Assets. From model (1) the produced and estimated residuals are according to Jones (1991) the *discretionary accruals*, which will be named (**DA**). All data are in millions €.

<sup>13</sup> In EU the governance effectiveness is higher and shadow economy is better controlled.

<sup>14</sup> If the international accounting and auditing standards will be adopted, then earnings management is expected to be further reduced.

<sup>15</sup> IOBE

<sup>16</sup> Jones (1991) model is not the only one to estimate tax avoidance by means of earnings management. There are many others such as: (Kang and Sivaramakrishnan, 1995) and Kothari et al. (2005), but they are more complicated, while Jones (1991) model is handy.

It should be noted that the estimated (**DA**) is either negative, or positive (Jones, 1991). If it is a positive number, then it is an *income increasing accrual*. A possible reason for this can be the attempt of a CEO to persuade the others before he (she) retires that he (she) is a person of good fame. In this case, higher profits are shown (Godfrey *et al.*, 2003; Reitenga and Tearny, 2003). If it is a negative number, then this could be due to an *income decreasing accrual* either for tax evasion purposes (Guenther, 1994), or according to (D'Souza, Jacob and Ramesh, 2001) when some companies, through the method of *earnings management*, show lower levels of profits when they are in the process of negotiating labor contracts.

The data of our analysis cover 12 companies<sup>17</sup> of the Greek construction sector during the period 2008-2014 and are taken from income statements as well as balance sheets. The produced *unbalanced* sample of panel data has in total 70 observations.

**Table 1.** *The Results of Regression (1)*

<b>Variable</b>	<b>Coefficient</b>	<b>P-value</b>
Constant	3,180	0,0267
<b>DSales</b>	-0,068	0,0174
<b>FA</b>	-0,203	0,0000
R <sup>2</sup>	0,472	...
Adjusted R <sup>2</sup>	0,456	...
S.E. of regression	17,956	...
<i>F</i> -statistic	29,936	0,0000
Durbin-Watson statistic	1,831	...

At 5% level of significance  $d_U = 1,64127$ . Hence there is not serial correlation in model (1), since  $d_U < DW < 2$ . The distribution of the residuals of (1) is normal at 5% level of significance.

#### **4.2 Relating accruals with shadow economy and capital tax rate**

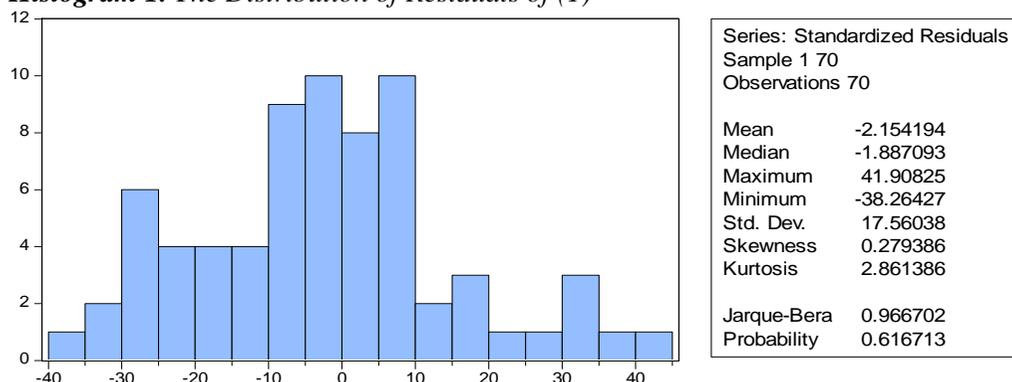
At first, one can estimate the impact of the above estimated *accruals*[**DA**]on the Greek shadow economy as a percentage of GDP [**sh\_ec**].

The *research hypothesis* is:

*H0: Discretionary Accruals of Greek construction Sector do not affect Greek Shadow Economy as a percentage of GDP.*

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<sup>17</sup> *The names of these companies are for obvious reasons kept secret and only the conclusions are mentioned.*

**Histogram 1. The Distribution of Residuals of (1)**

The model is

$$\mathbf{sh\_ec}_{it} = c_0 + c_1 \mathbf{DA}_{it} + \mathbf{error}_{it} \quad (2)$$

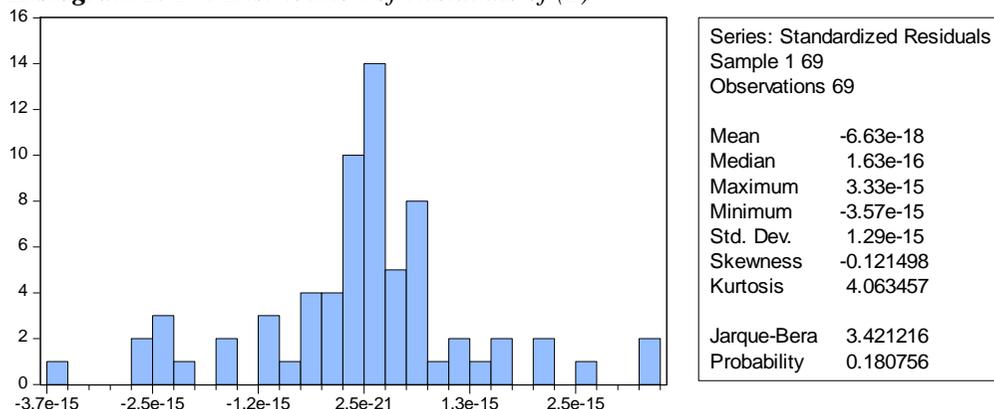
Variable **sh\_ec** denotes the level of *shadow economy* in each country as a percentage of official GDP, taken from Schneider et al., (2010) and Schneider, (2013). The data cover the same as above 12 companies of the Greek construction sector during the period 2008-2013. The produced sample has 69 observations in total in model (2).

**Table 2. The results of Regression (2)**

Variable	Coefficient	P-value
Constant	24,439	0,000
<b>DA</b>	-6,160E-17	0,011
R <sup>2</sup>	1,000	...
Adjusted R <sup>2</sup>	1,000	...
S.E. of regression	0,000	...
<i>F</i> -statistic	4,550E+30	0,000
Durbin-Watsonstatistic	1,945	...

It should be noted that at 5%  $d_U=1,63898$ . Hence there is not serial correlation in model (2), since  $d_U < DW < 2$ . The distribution of the residuals of (2) is normal at 5% level of significance.

**Histogram 2.** The Distribution of Residuals of (2)



**Table 3.** Robustness Tests of (2)<sup>18</sup>

TESTS	Panel EGLS (Cross-section weights)	Critical values (at 95%)
Heteroskedasticity <sup>(*)</sup>	4,048	5,991
RESET <sup>(**)</sup>	0,548	3,841
Normality <sup>(***)</sup>	3,421	5,991

**Notes:** <sup>(\*)</sup> Regression of the squared residuals on  $\hat{Y}$  and  $\hat{Y}^2$  <sup>(\*\*)</sup> Regression of residuals on  $\hat{Y}^2$  <sup>(\*\*\*)</sup> Normality test (Jarque Bera)

From the above table, it seems that model (2) (at 5% level of significance) is robust, for there is no heteroskedasticity, the specification is correct, the residuals are normally distributed, and finally there is no serial correlation. Hence, from table 2 it can be observed that at 5% level of significance **DA** has a negative impact on **sh\_ec** although in a very small scale. In other words, in the Greek construction sector during the period 2008-2014 *discretionary accruals* do affect<sup>19</sup> the *percentage of shadow economy in GDP*. Our *research hypothesis* is not accepted at level of significance 5%.

Second, one can also estimate the impact of the capital tax rate on the above accruals, in period 2008-2012.

The *research hypothesis* is:

*H0: Capital Tax Rate does not affect Discretionary Accruals of Greek construction Sector.*

<sup>18</sup> The diagnostic tests are based on Halkos (2003)

<sup>19</sup> This effect however is small in practice

The model is:

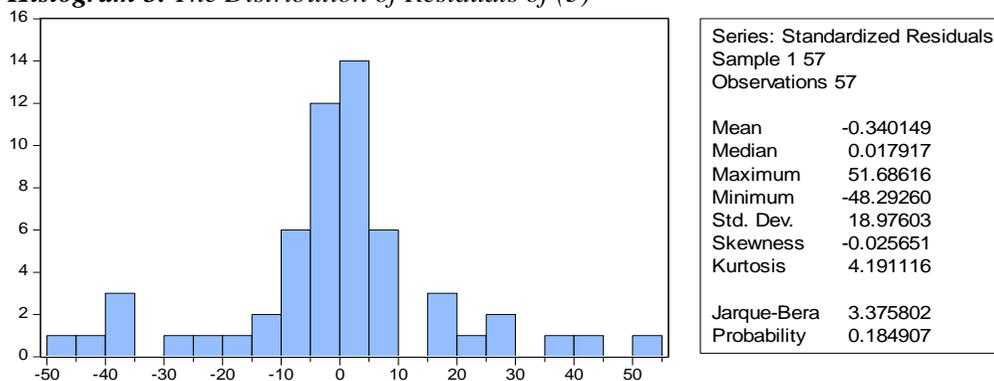
$$DA_{it} = c_0 + c_1 \text{cap\_tax}_{it} + \text{error}_{it} \quad (3)$$

**Table 4.** The results of Regression (3)

Variable	Coefficient	P-value
Constant	-50,766	0,0250
Cap_Tax	6,696	0,0322
R <sup>2</sup>	0,034	...
Adjusted R <sup>2</sup>	0,017	...
S.E. of regression	19,151	...
F-statistic	1,951	0,1681
Durbin-Watsonstatistic	1,743	...

It should be noted that, at 5% level of significance,  $d_U=1,60754$ . Hence there is not serial correlation in model (3), since  $d_U < DW < 2$ .

**Histogram 3.** The Distribution of Residuals of (3)



**Table 5.** Robustness Tests of (3)<sup>20</sup>

TESTS	Panel EGLS (Cross-section weights)	Critical values (at 95%)
Heteroskedasticity <sup>(*)</sup>	2,189	5,991
RESET <sup>(**)</sup>	0,987	3,841
Normality <sup>(***)</sup>	3,376	5,991

**Notes:** <sup>(\*)</sup> Regression of the squared residuals on  $\hat{Y}$  and  $\hat{Y}^2$  <sup>(\*\*)</sup> Regression of residuals on  $\hat{Y}^2$  <sup>(\*\*\*)</sup> Normality test (Jarque Bera)

<sup>20</sup> The diagnostic tests are based on Halkos (2003)

From the above table 5, it seems that model (3) (at 5% level of significance) is robust, for there is no heteroskedasticity, the specification is correct, the residuals are normally distributed, and finally there is no serial correlation. Hence, from table 4 it can be observed that at 5% level of significance **cap\_tax** has a positive impact on **DA**. In other words, in the Greek construction sector during the period 2008-2012 *discretionary accruals* (showing lower profits) increase in periods of higher capital tax rate. Our *research hypothesis* is not accepted at level of significance 5%.

Third, from model (1) one can derive the useful information that usually large companies resort to *earnings management* more than the small ones<sup>21</sup>. This can be seen in table 8. This finding agrees with the findings of Guenther (1994). This method can be used by the tax officers and the policy makers in order to estimate the tax avoidance in each company (not only in the construction sector, but also in any sector).

Our *research hypothesis* is:

*H0: There is no correlation between the company size and the earnings management*

**Table 6.** Spearman Correlation between total DA (2008-2014) and average FA (2008-2014)

	<b>DA</b>	<b>AverageFA</b>
<b>DA</b>	1	
<b>AverageFA</b> <i>p-value</i>	-0,785 0,0025	1

For each company of the sample total **DA** is created and **average FA** (average fixed assets for each company during the period 2008-2014). In table 6 it is observed that (at a level of significance 5%) there is a significantly negative correlation between the total **DA** and the **average FA** (*p-value*<5%). In other words, large companies resort to *earnings management* more than the small ones<sup>22</sup>. Our *research hypothesis* is not accepted at level of significance 5%.

<sup>21</sup> *It is made mainly by large companies that have well organized accounting department. Hence, large companies, compared to the small and medium firms (smes), are in a position to show a better picture in order to attract investors in the future. Consequently, in this case there is a distortion in market competition. Besides, it should not be ignored that smes face also two serious problems (shortage of experienced personnel and difficult access to finance) (Hamill, 1997). Thus, the big companies get even bigger while smes are gradually forced to leave the market. Consequently, market competition is further distorted.*

<sup>22</sup> *This distorts perfect competition at the cost of sme existence. Hence, large companies grow even bigger while smes bear the tax burden.*

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## 5. Conclusion

### 5.1 Econometric findings

In this article it is found: a) that in the Greek construction sector *discretionary accruals* in practice affect negligibly the *percentage of shadow economy in GDP*, b) in the Greek construction sector *discretionary accruals* increase in periods of higher capital tax rate, and c) in the Greek construction sector large companies resort to *earnings management* more than the small ones.

### 5.2 Discussion

In the present paper an attempt was made to estimate *earnings management* in a Greek sector. In fact, according to Tasios and Bekiaris, (2012) the quality of financial reports of Greek companies is of a poor quality. This is due mainly to *earnings management, poor corporate governance, family ownership* and not compliance with the accounting principles (Tasios and Bekiaris, 2012).

However, it must be noticed that *earnings management* is not the only type of shadow economy. Hence, shadow economy should not be examined only by means of *earning management* estimation. This trigger further research going beyond the limits of the present paper.

### 5.3 Enhancing the Model

This model can be applied in all sectors of the economy, to enable policy makers as well as taxation officers to estimate *earnings management* in all country and take the appropriate measures. Perhaps some sectors use earnings management at a greater extent than others. This must be an available information to tax officers and policy makers.

In this paper Jones model (1991) to estimate earnings management was used. One could further use more complicated and advanced models such as Kang and Sivaramakrishnan (1995) and Kothari *et al.* (2005).

### 5.4 Policy Implications

The *earnings management* is stronger in the bigger companies, since these companies have highly educated staff and in this way, they destroy *market competition*. It should be recalled that large companies compared to *SMEs* have easier access to finance. From the afore mentioned it becomes evident that *SMEs* will gradually be led to extinction. Governments should not hesitate to adopt international accounting and auditing standards to eliminate shadow economy, part of which is *earnings management*.

According to the Jones (1991) model, tax officers can *spot* the *tax evading* companies. Even in the case in which *earnings management* estimated values are not 100% correct, they are still an indicator and give a direction towards the elimination of shadow economy.

International accounting and auditing standards must be internationally adopted. One should bear in mind that countries, having robust accounting systems and high levels of transparency, enjoy economic growth and political stability (Georgiou *et al.*, 2015; Rogdaki *et al.*, 2011; Bekiaris *et al.*, 2011). In fact, the international adoption of *international accounting standards* will foster company profitability and eventually cause economic growth (Chen *et al.*, 2010; Leblond, 2011; Ponomareva and Melnikova, 2015; Tarca *et al.*, 2013; Yu and Wahid, 2014; Zeff, 2010).

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