Macrothink Institute™

International Journal of Accounting and Financial Reporting
ISSN 2162-3082
2019, Vol. 9, No. 2

The Influence of Political Costs on Income Smoothing: Evidence From Listed Egyptian Firms

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Received: March 26, 2019 Accepted: April 15, 2019 Published: April 17, 2019

doi:10.5296/ijafr.v9i2.14560 URL: https://doi.org/10.5296/ijafr.v9i2.14560

Abstract

Income smoothing is affected by some factors, one of these factors is political costs (PCs) which firms may pay to get information, trading, and negotiation which is imposed by the decision making and legislating authorities. Hence, the association between PCs and income smoothing is tested by focusing on Egyptian Stock Exchange (EGX), especially EGX 30, which included the most active firms, for a ten-year period from 2006 to 2015 for 63 firms, including 417 completed observations, the sample represented 10 different sectors. Two main hypotheses were formulated and tested, the first hypothesis consists of four sub-hypotheses, it was tested using multiple regression analysis, and the second hypothesis tested by testing the moderating effect of Egyptian revolution 2011 on the association between PCs and income smoothing. The findings are; first, PCs proxies have a positive and significant effect on income smoothing, second, there is a negative and significant moderating effect of Egyptian revolution 2011 on the association between firm size only and income smoothing.

Keywords: Political costs, Firm size, Employees' number, Government ownership, Income tax rate, Return on assets, Income smoothing

1. Introduction

Earnings management (EM) is "the alteration of firms reported economic performance by insiders to either ‘mislead some stakeholders’ or to ‘influence contractual outcomes’ " (Healy and Wahlen, 1999). Insiders, like management, could use their financial reporting discretion to overstate the ‘right’ earnings position. They bide unfavorable income which could help outsiders, like shareholders, to take a decision related to insiders. Leuz et al. (2003) extend

the last definition to indicate that with extensive EM, "financial reports inaccurately reflect firm performance and consequently weaken the ability of outsiders to govern the firm".

Most EM practices occur through at least one strategy of typically two strategies. These strategies are creative accounting and income smoothing. The first strategy, creative accounting, involves increasing a disclosed income to put a firm in a favorable position and using flexibility afforded under minimum disclosure requirement (Lobo and Zhou, 2001). The second strategy, income smoothing, is working to transfer a part of firm's income from reported earnings to earnings in non-performing periods by creating reserves (Wan Mohammad et al. 2011).

Regarding income smoothing, investors take a decision based on the financial information which is found in the financial statements, the most important information is reported earnings, and this number must be steady not fluctuated because investors think the steady earnings secure a high rate of dividend. In addition, they believe fluctuation in earnings is considered as an important factor to compute total risk for firms which means a high smoothed income have fewer total risks, more appealing and more suitable investments (George and Furstenberg, 2006).

Studies interested in income smoothing are divided into two main groups; the first group deals with the effect of income smoothing on the firm performance. The second group deals with the determinants of income smoothing. One of these determinants is political costs (PCs) which will discussed and tested in this paper by applying on listed Egyptian firms in EGX 30.

1.1 Political Costs (PCs)

Political sectors in most countries, such as parliament and government, are working to achieve fairness in income between the sectors by using their power to transfer wealth between various sectors. The most affected sector by these wealth redistributions is the corporate sector, since this sector bears a lot of burdens due to these redistributions such as, taxes, and costs labor unions impose through increased demands generated by large reported earnings which are called Political costs (PCs).

The first study proposed term "political costs (PCs)" was Watts and Zimmerman (1978) when they define it as "a government-imposed wealth transfers which are including all expected costs imposed on a firm from potential adverse political actions involving antitrust, regulation, government subsidies, taxes, tariffs, etc.", There are some proxies to represent and measure PCs, Watts and Zimmerman (1978) and Akhoondnejad et al. (2013) determine some of these proxies' variables which are:

Firm Size: Most studies confirm the positive association between firm size and firm political sensitive, large firms are politically more sensitive than smaller ones because large firms contribute more to the national economy; thus, increase in the reported earnings of larger firms creates greater sensitivity (Poorheidari & Hemmati, 2004). Watts and Zimmerman (1978) and (1986) mention that large firms are subject to more governmental actions in form of more regulations or additional taxes and duties to ensure wealth transfer away from large firms. In addition, large firms have higher political sensitivity in form of more intense public

pressure which forces them to act socially responsible and to adjust their actions and behaviors to what is expected by their social environment.

However, not all studies agreed with considering firm size as the only proxy for PCs, they get evidence that firm size could be a weak PCs proxy. For example, Ball and Foster, (1982) note industry membership may be a more important determinant of PCs rather than firm size, in addition, Chen et al. (2011) mention that it is not suitable to use "firm size" as an only proxy for PCs.

Income tax rate: Income tax is affected by regulations in country, these regulations are different from country to other based the political and economic policy. Zimmerman (1983), and Gupta (1995) use Income Tax Rate (ITR) as one of PCs proxies. In addition, these studies prove that reported tax rate is associated with a firm's PCs, which pushes to considering income tax rate as one of PCs proxies.

A number of employees: Firms that have high number of the employees receive a greater pressure from their employees. This pressure can be done by employees themselves or labor unions which have an effect on cost of labor and in kind benefits that employees can get, this can explain the reason to consider number of employees is one is one of PCs proxies. (Akhoondnejad et al., 2013).

Government ownership: In most of emerging countries, the government is the main supporters of the national economy due to its decision-making authority in the firm arena and their macro policies. Sharing government in firms' ownership effects on firms' performance and outputs, which bears these firms some sacrificing, for example, government ownership firms can sacrifice part of their revenues when they are pushed by government to sell their products with prices lower than competitors, or pushed to increase their participation in social responsibility activities.

1.2 Political Costs Hypothesis

Corporate sector, which is the most affected sector of PCs, is facing it through employing some devices, like selection of accounting procedures to control reported earnings. Management can reduce the likelihood of adverse political actions and reduce its expected costs, including the legal costs would incur opposing these political actions (Watts and Zimmerman, 1978; and Tehrani, 2009).

In PCs hypothesis, managers face regulatory attention which is an EM incentive to decrease PCs. Managers have some tools to reduce earnings and related PCs; like increasing reserves which reduce costs, through tax savings, which leads to increase the firm's stock price. While higher stock prices increase stockholders' personal wealth, managers also benefit to the extent that their compensation is tied to share price. Thus, in the case of PCs, EM can be viewed as an aiding for both stockholders and managers (Watts and Zimmerman, 1978).

Watts and Zimmerman (1978) concentrate on firm size as an accounting measure that captures a firm's sensitivity in the political process; large firms face greater political vulnerability and are subject to larger transfers of wealth. To test the sensitivity of a firm in

the political process, Watts and Zimmerman (1978, and 1986) formalize the size hypothesis. This hypothesis asserts that the larger the firm, more likely to accept General Price Level Adjusted (GPLA) accounting practices which decrease reported earnings which is targeted by adverse political actions to prevent transferring wealth away from the firm which is good for both management and shareholders. They get evidence that large firms have a great motivation to hide earnings which could bring suspicion that it comes from monopoly situations; the government may use its policies to transfer wealth. Poorheidari and Hemmati (2004) mentioned that management of high firm size has a great motivation to give a better image of the firm's performance to related outsiders.

There are other studies confirm that income tax is one of the smooth income incentive. Target profit oriented firms manage earnings downward for decreasing current period firm tax, the same PCs provide a motivation to reduce tax payments using earnings accounting policies (Garrod et al., 2007). In addition, there is a positive association between politically sensitive and tax rates, since the politically sensitive firms pay higher tax rates to the government due to the interplay of the firm's political sensitivity with a view to the PCs related to taxation (Mills et al., 2013).

Mora and Sabater (2008) confirm that a number of employees have an effect on the political pressure, and the management tries to decrease it. Managers depress earnings prior to labor negotiations.

Finally, government ownership firms bear lower costs because of their political attachment. Ding et al. (2007) mention that the private firms show a higher tendency towards their profit maximization. However, the pursuit of self-interest on the part of major owners on income smoothing is less frequent in private firms than public ones. Akhoondnejad et al. (2013) confirm privatization authorities are advised to give more interest to the effect of government ownership on managerial decision making.

1.3 Egyptian Environment

Chen et al. (2011) indicates that PCs in emerging countries, like Egypt, is different from western countries, in addition, Egypt passed a unique experience, which is Egyptian revolution 2011, as the most political event happened in Egypt in the twenty-first century (Puspitasari, 2017). Since 2010, series of protests happened in North Africa-Middle East countries. It started in Tunisia, however, these protests were called "Arab Spring" when they arrived at Egypt on January 25th, 2011 (Puspitasari, 2017), when mass protests toppled Pres. Hosni Mubarak regime clashed with security forces in the majority of Egyptian cities.

This revolution succeeded to eliminate of last president and his supporter, and provided a good atmosphere to manage fair elections, which confirms that Egyptian revolution 2011 has a greater effect on Egyptian environment, which encourage asking about the effect of this revolution on the association between the political costs proxies and income smoothing.

2. Literature Review and Hypotheses Development

2.1 The Effect of the Political Costs Proxies on Income Smoothing

Previous studies can be classified into three groups, according to their interest, some concern with particular events, other concern with particular countries, and other concern with particular industries.

Example for studies that interested in particular events are; Han and Wang (1998) discuss the accounting policies are adopted by oil firms during the 1990 Gulf crisis when rising oil prices. They find that oil firms reduced their earnings in this year through manipulation in special accruals and inventory. Han and Nwaeze (2015) mention that the level of political spending and the behavior of abnormal accruals and discretionary expense items, that related to healthcare reform for US firms in 2008, are consistent with a strategy by the drug makers to reduce the adverse effect of any such reforms . Hsiao et al. (2016) discuss whether US oil and gas firms engaged in EM during 2011 Arab Spring. The results support the PCs hypothesis. However, further analyses indicate that the small oil and gas firms are politically less sensitive to this association.

Other researches interested in applying PCs hypothesis in particular countries, such as Makar et al. (1996) who focus on the accrual manipulations of firms subject to antitrust investigation and examine the association between accrual manipulations and PCs for sample of US firms from 1974 to 1992, they get evidence that firms have a greater incentive to decrease total accruals for reducing reported earnings and PCs. Haw et al. (2005) study EM in China and find managers who are indulging in income-increasing methods to respond for a sample of listed Chinese firms from 1996 to 1998 demand the accounting rates which must be higher than 10% to consider a firm is qualified to stock rights offers. Akhoondnejad et al. (2013) get evidence that there is a significant association between PCs and income smoothing; reducing PCs is the major motive for EM to increase management compensation for sample of listed firms in Tehran Stock Exchange (TSE) from 2006 to 2011. Attia et al. (2016) study the association between PCs and EM in Tunisia for sample of non-financial firms listed in the Tunisian stock exchange between 2007 and 2011, they use executives' political connection and state control as PCs proxies, and find the executives' political connection is not directly related to EM. However, the interaction between executives' political connection and the state control affects the firm's sensitivity to political pressure and its EM practices.

Some other researches interested in PCs hypothesis in particular industries, such as Key (1997) who finds most firms which are impacted by proposed regulation of the cable television industry as a political event has lower discretionary accruals for sample of US firms from 1989 to 1995. Cahan et al. (1997) find the chemical clean-up fund affect the most chemical firms; the superfund firms have lower also discretionary accruals while the legislation was being debated in the U.S. Congress. They mention that the PCs argument offers another reason for lower accruals and EM for top 50 US Chemicals firms from 1979 to 1992. Monem (2003) discuss the association between the PCs and income smoothing for the industry of Australian gold mining, he confirms the decreasing in accruals in the Australian gold mining industry during the period from 1985 to 1988, the findings support the PCs

hypothesis. Chen et al. (2011) discuss the association between PCs and EM in real estate market in in China they find that PCs are negatively related to EM in listed real estate firms in China, which is consistent with the political costs hypothesis. Kaya and Turegun (2017) investigate the practice of EM and its manipulation types; the finding indicates that firms that face high PCs are more expected to manage earnings.

Based on these studies, the following hypothesis is:

H1: There is a positive and significant association between PCs and income smoothing.

Considering the classification of political costs proxies, this hypothesis is divided into the four following sub-hypotheses:

2.1.1 Firm Size and Income Smoothing

There are many studies used firm size as PCs proxy and linked it with EM or income smoothing, Herrmann and Inoua (1996) test the association between smoothing behavior and six factors hypothesized, including firm size and income taxes. They limit their study to Japanese managers from 1986 to 1992; they get evidence that firm size has a significant association with incentives to use smooth income depreciation changes. Poorheidari and Hemmati (2004) study the EM determinants in the TSE, they find a positive and significant association between debt-to-equity ratio and EM. With a large firm size, management has a great motivation to give a better image of the firm's performance to related outsiders; they also find a positive and significant association between firm size and reduction of earnings tendency. Akhoondnejad et al. (2013) study the association firm size and income smoothing and confirm the positive and significant association between them. With a large firm, the more it gets into the political concern due to its significant role in the macro-economy. There are other confirm a positive and significant association between firm size and income smoothings, such as Hsiao et al. (2016) and Kaya and Turegun (2017). Based on these studies, the following sub-hypothesis is:

H1A: There is a positive and significant association between Firm size and income smoothing.

2.1.2 Income Tax and Income Smoothing

Herrmann et al. (1996) get evidence that income taxes have a significant incentive to smooth income. Garrod et al. (2007) examine economic motivations subject to the impact of PCs on accounting choice. They find profit firms manage earnings downward for decreasing current period firm tax. The same PCs provide a motivation to reduce tax payments using earnings accounting policies. Saeidi, (2012) study the association between income smoothing, tax income and profitability ratio. This study uses TSE financial information for 168 firms during period from 2001 to 2007. They get evidence that there is a significant association between income smoothing and income tax.

Akhoondnejad et al. (2013) study the association between income tax rate, as PCs proxy, and income smoothing. They get evidence that there is a significant association between them

which means income tax rate is another factor which affects EM. With large firms, managers use the accruals to decrease tax.

In related work, Mills et al. (2013) investigate the association between both a firm's political sensitivity and bargaining power on PCs, they find that firms that rely on government contracts report higher ITRs because their political sensitivity increases. Zeng (2014) study EM practices after issuing corporation tax reform in 2007. They indicate that real estate use accrual and real activities to manage earnings, they also suggest that these firms shifted income from the fourth quarter of 2007 to the first quarter of 2008. Belz et al. (2019) get evidence supports PCs hypothesis when they prove a positive and significant association between Effective tax rate and firm size for sample of US firms.

Based on these studies, the following sub-hypothesis is:

H1B: There is a positive and significant association between income tax rate and income smoothing.

2.1.3 Number of Employees and Income Smoothing

Darrough et al. (1998) examine choices of accounting accruals for Japanese firms and comparing them to US firms. They find a number of employees' effects on the political pressure, and the management tries to decrease these pressures, this result was corresponding with U.S. firms. Mora and Sabater (2008) argue that the PCs hypothesis is better suited to European countries. They took a sample of Spanish firms from 1995-2002 to analyze total and discretionary accruals with passing the time of labor negotiations. They find managers depress earnings prior to negotiations. Akhoondnejad et al. (2013) study the association between the number of employees, as political costs proxy, and income smoothing. They find a significant association between them. Finally, they confirmed a positive coefficient between the number of employees and the income smoothing.

Based on these studies, the following sub-hypothesis is:

H1C: There is a positive and significant association between number of employees and income smoothing.

2.1.4 Government Ownership and Income Smoothing

Ding et al. (2007) analyze a sample of privately and state-owned Chinese firms listed in 2002, they discover that private firms have a higher tendency to maximize profit than public ones. Akhoondnejad et al. (2013) study the association between government ownership, as PCs proxy, and income smoothing. They confirm the positive association. Therefore, privatization authorities are advised to give more interest to the effect of government ownership on managerial decision making. Zeng (2014) finds that state ownership has a negatively association with accrual-based EM.

Based on these studies, the following sub-hypothesis is:

H1D: There is a positive and significant association between government ownership and income smoothing.

To get the association between PCs and income smoothing, the following baseline model is:

$$TAi, /Ai,-1 = \alpha 0 + \alpha 1 SIZE\ it + \alpha 2\ ITR\ it + \alpha 3 EMPLY\ it + \alpha 4\ GOV\_OWN\ it + \alpha 5\ ROI\ it + \alpha 6\ LEV\ it + \alpha 7\ CHANGE\ it + \alpha 8\ TOP\ it + \alpha 9\ BM\ it + \alpha 10\ ACT\_SEC\ it + \alpha 11\ YEARit + \varepsilon\ it \quad (1)$$

Table 1. Measuring variables

Variables	Abbreviation	Measure	Biographic references
Dependent variable			
Income Smoothing	$TAi, /Ai,-1$	Using Jones model	Jones (1991)
Independent variable			
Firm Size	**SIZE** it	Natural logarithm (LN) of total assets.	Poorheidari and Hemmati (2004), Akhoondnejad et al. (2013), Hsiao et al. (2016) and Kaya and Turegun (2017).
Income Tax Rate	**ITR** it	Ratio of Income-tax to net income before tax deduction	Garrod et al. (2007), Saeidi (2012), and Akhoondnejad et al. (2013)
Number of employees	**EMPLY** it	Natural logarithm (LN) of employees number at the end of the period	Mora and Sabater (2008) and Akhoondnejad et al. (2013)
Governmental Ownership	**GOV_OWN** it	Ratio of stocks owned by governmental firms to total stocks	Astam and Tower (2006), Ding et al. (2007), BaniMahd and Baghbani (2009), Akhoondnejad et al. (2013), and Zeng, (2014)
Control variables			
Return On Investments	**ROI** it	ratio of net Income before tax and interest to total assets	Lei and Liu (2006), Huang et al. (2009), and Saeidi (2012)
Leverage	**LEV** it	Ratio of total liabilities to total assets	Bartov et al. (2000), and Chen et al. (2011)

Change of board chairman	**CHANGE** it	It is dummy variable equals 1 if firm change board chairman, otherwise it will be zero.	Zhu (2005)
Largest shareholder	**TOP** it	Ratio of shares of the largest shareholders to total shares.	Li and Guan (2004)
Book value to Market value	**BM** it	Dividing book value of the owner's equity to market value.	Akhoondnejad et al. (2013)
If the firm is involved in on of the five big sectors.	**ACT_SEC it**	Dummy variable equals 1 if firm is involved in one of the most active sectors, otherwise it will be zero.	Researcher
Year of the observation	**YEAR** it	Dummy variable equals 1 if firm year is 2011 or after, otherwise it will be zero.	Researcher

This model is baseline model which is called Model (1), but testing the sub-hypotheses can be done by formulating model for each sub-hypothesis. Model (2) concerns with the effect of firm size only. Model (3) concerns with the effect of income tax rate only. Model (4) concerns with the effect of number of employees only. Model (5) concerns with the effect of governmental ownership only PCs on income smoothing.

2.2 The Moderating Effect of the Egyptian Revolution 2011 on the Association Between the PCs Proxies on Income Smoothing

It could be claimed that Egyptian revolution in 2011 is the most important event in the twenty first century in Egypt. As mentioned before, this revolution has made radical changes in social and political and economic environment of the country.

Concerning the economic changes due to this revolution in general, the question is about the impact of this revolution on the association between the political costs proxies on income smoothing, which is represented in the following hypothesis:

H2: The Egyptian revolution 2011 has a moderating effect on the association between PCs proxies and income smoothing.

To test this hypothesis, Model (1) is modified to analyze the moderating effect of Egyptian revolution 2011 on association between PCs and income smoothing by adding the multiplication YEAR*SIZE, YEAR*ITR, YEAR*EMPLY, and YEAR*GOV_OWN which is:

$$TAi,/Ai,-1 = \mu 0 + \mu 1\ \text{SIZE it} + \mu 2\ \text{ITR it} + \mu 3\text{EMPLY it} + \mu 4\ \text{GOV\_OWN it} + \mu 5\ \text{ROI it} + \mu 6\ \text{LEV it} + \mu 7\ \text{CHANGE it} + \mu 8\ \text{TOP it} + \mu 9\ \text{BM it} + \mu 10\ \text{ACT\_SEC it} + \mu 11\ \text{YEAR it} + \mu 12\ \text{YEAR it} \times \text{SIZE it} + \mu 13\ \text{YEAR it} \times \text{ITR it} + \mu 14\ \text{YEAR it} \times \text{EMPLY it} + \mu 15\ \text{YEAR it} \times \text{GOV\_OWN it} + \varepsilon\ \text{it} \quad (2)$$

3. Research Method

3.1 Data Description

Regarding Egyptian firms which were listed in Egyptian stock market, it was depended on published annual reports in www.mubasher.info, www.investing.com, and www.wvb.com to get financial data, and used www.kompass.com to get non-financial variables which are EMPLY, CHANGE.

Due to using regression in calculation EM as an income smoothing proxy and including the major political event, which was 2011 Egyptian revolution, the final sample included a period from 2006 to 2015, the sample stopped at 2015 because some data was not available after 2015, like number of employees. Due to missing or non-consecutive years of data, the final sample included 63 Egyptian firms that listed in EGX 30 and 417 completed observations including common sectors in Egypt.

The sample includes 10 main sectors which are 14 firms in real estate sector, 10 firms in construction and material sector, 8 firms in food and beverage sector, 7 firms in financial service sector (excluding banks), 4 firms in basic resources sector, 5 firms in chemicals sector, 5 firms in industrial goods and services sector, 5 firms in telecommunication sector, 2 firms in travel sector, 2 firms in personal goods sector, and one firm in media sector.

3.2 Descriptive Statistics

Table 2 introduces descriptive statistics of all study variables in 63 listed firms in EGX 30 for the period from 2006 to 2015 to present the characteristics of data.

Table 2. Descriptive statistics of the variables

Variables	N	Mean	Median	Standard deviation	95% confidence interval	
					Minimum	Maximum
$TAi,/Ai,-1$	417	-0.0051	-0.0016	0.1009	-0.4361	0.3161
SIZE it	417	6.0773	6.1317	0.7454	4.0203	7.7062
ITR it	417	0.1508	0.1518	0.1422	0.0000	0.7939
EMPLY it	417	2.8543	2.9961	0.8861	0.0000	4.7324

GOV_OWN it	417	0.1012	0.0712	0.1004	0.8451	0.4233
ROI it	417	0.2644	0.1085	0.3116	0.0000	0.9300
LEV it	417	0.5573	0.4382	0.9502	0.0027	1.0000
CHANGE it	417	0.1703	0.0000	0.3763	0.0000	1.0000
TOP it	417	0.3742	0.3494	0.2405	0.0000	0.9800
BM it	417	1.5746	0.8200	2.0556	0.0109	8.7004
ACT_SEC it	417	0.4532	0.0000	0.4984	0.0000	1.0000
YEAR it	417	0.4676	0.0000	0.4996	0.0000	1.0000

Based on information was recorded in Table 2, it can be concluded that the means of firm size can be ordered from the lowest to the highest as using total revenue, then market capitalization, and then total assets which are the highest mean.

3.3 Correlation

Before testing hypotheses, the fitness and adequacy of the model are determined by measuring the normal distribution of the residuals and the existence of no correlation between the residuals; then the stability of the residual variance is studied by preparing the following table.

Table 3. Variables correlation

Variables	$TAi/Ai,-1$	SIZE	ITR	EMPLY	GOV_OWN	ROI	LEV	CHANGE	TOP	BM	ACT_SEC	YEAR
$TAi/Ai,-1$	1											
SIZE	0.329***	1										
	0.000											
ITR	0.250***	0.123***	1									
	0.000	0.006										
EMPLY	0.312***	0.569***	0.184***	1								
	0.000	0.000	0.000									

GOV_OWN	0.196***	0.017	0.204***	0.307***	1							
	0.000	0.368	0.000	0.000								
ROI	0.183***	0.207***	0.205***	0.175***	0.425***	1						
	0.000	0.000	0.000	0.000	0.000							
LEV	0.195***	0.046	0.152***	0.111**	-0.047	-0.044	1					
	0.000	0.175	0.001	0.011	0.171	0.184						
CHANGE	0.249***	0.111**	0.075*	0.172***	0.215***	0.170***	0.100***	1				
	0.000	0.011	0.062	0.000	0.000	0.000	0.020					
TOP	0.082**	0.244***	0.044	0.520***	0.238***	-0.055	0.105***	-0.048	1			
	0.047	0.000	0.187	0.000	0.000	0.130	0.016	0.165				
BM	0.224***	0.046	0.148***	0.097**	-0.128***	-0.108***	0.169***	0.031	-0.079*	1		
	0.000	0.177	0.001	0.024	0.004	0.014	0.000	0.263	0.054			
ACT_SEC	0.087**	-0.092**	0.012	-0.349***	-0.174***	-0.151***	0.099***	-0.079*	-0.163***	0.173***	1	
	0.038	.030	0.405	0.000	0.000	0.001	0.021	0.053	0.000	0.000		
YEAR	0.032	-0.001	0.198***	-0.046	0.077	-0.080**	-0.080**	-0.003	-0.048	-0.060	0.093**	1
	0.259	0.494	0.000	0.172	0.059	0.052	0.050	0.479	0.165	0.111	.029	

This table provides correlation matrix of all variables comprising Pearson correlation coefficient. This table and all next tables include: *significance at the 10%, ** significance at the 5%, and *** significance at the 1%.

Table 3 show Pearson correlations among all variables with concentrate on the main variables of interest; it is observed that the earnings smoothing has a positive correlation with all PCs proxies at significant level 1% for all tables, which supports the premise in this study where hypothesis a positive linkage between earnings smoothing and PCs proxies.

Through noticing correlation table, the correlation is between 0.569, and -0.349 which indicates that the all variables are not suffering of multicollinearity problems, which will be confirmed in the following section.

3.4 Diagnostic Statistics

Four diagnostic tests are conducted on all data based on Model (1) to assure that the results will not be biased, these tests include:

3.4.1 Group Unit Root Test

A stationary time series enables the researcher to generalize the results to future time periods. This test measures the significance at rate less than (0.05) through following table.

Table 4. Group unit root test concerning all variables

Method	**Statistic**	**Prob.****	**Cross sections**	**Obs**
Levin, Lin & Chu (LLC)	-28.6666	0.0000	14	3959
Im, Pesaran and Shin W-stat (IPSW)	-28.7616	0.0000	14	3959
Fisher Chi-square (ADF)	763.553	0.0000	14	3959
Fisher Chi-square (PP)	777.124	0.0000	14	3970

Table 4 shows that the P-values of LLC, IPSW, ADF and PP tests are (P-value = 0%) which are less than 0.05, this means that all variables in the current research have stationary time series. Thus, the present research's results can be generalized to future time period from 2006 to 2015.

3.4.2 Breusch-Godfrey Serial Correlation Test

To test for the presence of serial correlation, Checking for serial correlation existence among variables is important as the presence of problem in serial correlation would mean that the results of the analysis are incorrect. Breusch-Godfrey serial correlation test uses F-statistic and chi-square value at a significance level (P- value > 0.05) through following table.

Table 5. Breusch-Godfrey serial correlation test concerning all variables

F-statistic	2.485363	Prob. F(2.279)	0.0851
Obs*R-squared	4.971239	Prob. Chi-Square (2)	0.0833

As shown in Table 5, the probability of F-test (0.085) and the probability of chi-square (0.083) which are greater than (0.05). Thus, there is no serial correlation between independent and dependent variables in both empirical models. This means that the results of the current research will be correct, and conclusions will not be biased.

3.4.3 Heteroskedasticity Test: Breusch-Pagan-Godfrey

Heteroskedasticity means that the standard deviation of variables is not constant which may lead to biased results or misspecification of other tests. Breusch–Pagan test measures heteroskedasticity in the model using F-statistic and chi-square test with a significance value greater than 0.05 through following table.

Table 6. Heteroskedasticity test: Breusch Pagan Godfery concerning all variables

F-statistic	0.011032	Prob. F (2,281)	0.9890
Obs*R-squared	0.022297	Prob. Chi-Square(2)	0.9889
Scaled explained SS	0.059302	Prob. Chi-Square(2)	0.9708

Table 6 shows that the probability of F-statistic is 0.989 and the probabilities of chi-square are 0.989 and 0.971. As long as, the values are greater than 0.05 therefore there is a homoscedasticity (constant variance) among all variables in the current research.

3.4.4 Omitted Variable Test: Ramsey RESET Test

This test examines the relationship between errors and independent variable. Ramsey RESET test shows that the probability of F-statistic is 3.46 and the probability of chi-square is 0.1068 so, the values are greater than 0.05 therefore there is no omitted variable between error and independent variable.

In summary, based on the previous diagnostic tests, the results clarified that current research variables have a stationary time series, thus the current research results can be generalized to future periods. Additionally, the variables have a long-term equilibrium relationship except for firm size. Finally, there is no serial correlation and heteroskedasticity and omitted variable among the variables, which indicates that the results will not be biased.

3.5 Regression Results

To test hypotheses and get results, models from Model (1) to Model (5) are used for testing the first hypothesis and (6) is used for testing the second hypothesis, which is indicated in the following table.

Table 7. Regression results of effecting of PCs on earnings smoothing

Independent Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	-0.285***	-0.277***	-0.103***	-0.162***	-0.101***	-0.373***
	(-7.61)	(-7.59)	(-8.14)	(-9.09)	(-7.96)	(-7.16)
SIZE it	0.028***	0.032***				0.043***
	(3.75)	(5.15)				(4.28)

ITR it	0.064**		0.080**			0.117**
	(1.96)		(2.38)			(2.34)
EMPLY it	0.014*			0.031***		0.009
	(1.89)			(4.79)		(1.05)
GOV_OWN it	0.035**				0.025*	0.041*
	(2.21)				(1.91)	(1.90)
ROI it	0.103**	0.182***	0.207***	0.192**	0.209***	0.104**
	(2.21)	(4.47)	(4.88)	(4.67)	(4.64)	(2.18)
LEV it	0.018***	0.020***	0.018***	0.019***	0.022***	0.017**
	(2.62)	(2.99)	(2.58)	(2.70)	(3.05)	(2.57)
CHANGE it	0.040***	0.049***	0.054***	0.044***	0.051***	0.036***
	(3.38)	(4.19)	(4.47)	(3.71)	(4.13)	(3.02)
TOP it	-0.010	0.028	0.051***	-0.003	0.046**	-0.009
	(0.046)	(1.46)	(-2.69)	(-0.17)	(2.30)	(-0.38)
BM it	0.008***	0.009***	0.009***	0.008***	0.011***	0.009***
	(4.54)	(4.31)	(4.20)	(3.52)	(4.75)	(3.86)
ACT_SEC it	0.030***	0.021**	0.020**	0.035***	0.021**	0.028***
	(3.11)	(2.35)	(2.13)	(3.62)	(2.21)	(2.97)
YEAR it	0.006	0.014	0.010	0.014	0.014	0.182**
	(0.62)	(1.58)	(1.10)	(1.61)	(1.55)	(2.48)
YEAR it* SIZE it						-0.029**
						(-2.06)
YEAR it* ITR it						-0.087
						(-1.36)
YEAR it* EMPLY it						0.006

						(0.45)
YEAR it* GOV_OWN it						-0.000
						(-0.00)
N	417	417	417	417	417	417
R^2	0.286	0.259	0.222	0.253	0.215	0.300
Adjusted R^2	0.267	0.244	0.206	0.238	0.200	0.274
F. value	14.77	17.81	14.51	17.24	13.96	11.45
Significance	0.000	0.0000	0.0000	0.0000	0.0000	0.0000

This table shows the regression results for observation from 2006 to 2015. Each intersecting is representing in two numbers, the first number is the coefficient and the second number (within brackets) is T-stats.

Regarding the fitness of data, F. value is between 11.45 at Model (6) and 17.81 at Model (2), with p. value = 0 for all panels, which means that all models are fit, and the results that are extracted from these models are significant.

About the effect of PCs on earnings smoothing, Table 7 indicated that there is a positive and significant effect of all PCs proxies for all models, which means management practices to smooth earnings are affected with PCs regardless the proxy could be used to express this costs.

From noticing ROI in all models of Table 7, firm management which has a high ROI is going to increase its practices to control or smooth earnings, this result is consistent with Lei and Liu (2006) and Saeidi (2012). However it does not support Huang et al. (2009) result who prove a negative association between ROI and income smoothing.

By noticing LEV in all models of Table 7, firm management which has a high LEV faces the risk of violating their debt contracts is more likely to choose accounting procedures that can shift future earnings to the current period to avoid default costs, which means increase the incentives to control and smooth earnings, this result is consistent with Bartov et al. (2000); Chen et al. (2011) and Akhoondnejad et al. (2013).

In addition, Table 7 indicates that change of Board Chairman (CHANGE) can bring changes to a firm's production plan and investment and financing strategies. These changes can depreciate the original value of assets. To better fulfill a firm's future profitability goals, a new manager may manage earnings to shift responsibility to the previous manager, this result is consistent with Zhu (2005) in China.

About the effect of presence largest shareholder (TOP) on income smoothing, Table 7 in baseline model (Model (1)) indicates that there is no significant effect of TOP on income smoothing.

Table 7 introduces evidence that management can face a deep problem against shareholders when market value of shareholders decreases in the front of book value which represents a management's weakness point, the management may follow some procedures to support their position, one of these is managing and controlling firm's income. This result is consistent with Akhoondnejad et al. (2013).

About the effect involving in on the biggest sectors and income smoothing, Table 7 indicates that management of the biggest sectors firms have some tools to save them in this position, controlling and managing income and achieving income smoothing is one if this used tools. Finally, Table 7 indicates that there is no significant effect of Egyptian revolution 2011 on income smoothing.

4. Regression Analysis and Testing Hypothesis

Using available data leads to estimate a regression model on panel data in presence of heteroscedasticity of variables, since the objectives of this paper are; testing the association between PCs proxies and income smoothing, and testing the moderating effect of Egyptian revolution 2011 on the association between PCs and income smoothing which are got from the Table 7.

Regarding testing the association between PCs and income smoothing, Models (1), (2), (3), (4), and (5) in Table 7 indicate the following results.

- Concerning with Models (1), (2) and (6), there is a positive and significant association between firm size, as a PCs proxy, and income smoothing which leads to accept the first sub-hypothesis (H1A) at a significant level 1% in all models, which means that managements of large firms size have great motive to give a better image of their performance to outsiders and get-ride of political concerns, which lead them to use possible accounting practices to smooth and control income. This result supports Herrmann and Inoua (1996), Poorheidari and Hemmati (2004), Akhoondnejad et al. (2013), Hsiao et al. (2016) and Kaya and Turegun (2017).
- Concerning with Models (1), (3) and (6), there is a positive and significant association between income tax rate, as a PCs proxy, and income smoothing which leads to accept the second sub-hypothesis (H1B) at a significant level 5% in all models, which means that managements that face high income tax rate use possible accounting practices to smooth and control income. This result supports Herrmann et al. (1996), Garrod et al. (2007), Saeidi (2012), Akhoondnejad et al. (2013), and Zeng (2014).
- Concerning with Models (1), and (4), there is a positive and significant association between number of employees, as a PCs proxy, and income smoothing which leads to accept the third sub-hypothesis (H1C), at a significant level 10% in Model (1) and 1% in Model (4), which means firms managements that have higher number of employees are

going to decrease employees institutions pressure (political pressure) by controlling and smoothing there income. This result supports Darrough et al. (1998), Mora and Sabater (2008), and Akhoondnejad et al. (2013).

- Concerning with Models (1), (5), and (6) there is a positive and significant association between governmental ownership, as a PCs proxy, and income smoothing which leads to accept the fourth sub-hypothesis (H1D), at a significant level 5% in Model (1) and 1% in Models (5) and (6), this means managements of governmental ownership firms tends to enhance their image at the front of government by controlling and smoothing income, Therefore, privatization authorities are advised to give more interest to the effect of government ownership on managerial decision making. This result supports Akhoondnejad et al. (2013), but it does not support Ding et al. (2007), and Zeng (2014).

Finally, based on results of last four sub-hypotheses and model significance, it has been approved there is a positive and significant association between PCs and income smoothing, therefore, the first hypothesis (H1) will be accepted.

According to the significance in Models (2), (3), (4), and (5), the effect of PCs proxies on income smoothing can be ranked, which are (1) firm size, (2) number of employees, (3) income tax rate, (4) government ownership.

Regarding testing the moderating effect of Egyptian revolution 2011 on the association between PCs and income smoothing, Model (5) indicates that revolution has a negative and significant effect on the association between firm size and income smoothing, which means the association between them before 2011 was stronger than after 2011, in other words the monitoring and pressure of government on large firms is lower after Egyptian revolution 2011 which effect on firms income smoothing practices. However, other PCs proxies, such as income tax rate, number of employees, and governmental ownership, do not have significant moderating effect on the association between PCs and income smoothing, which means the association between these PCs proxies and income smoothing does not effected by Egyptian revolution 2011 which leads to not full accept the second hypothesis (H2).

5. Conclusion

Firms' financial reports are prepared under a strict audit by auditors, which would lead to providing reliable financial information. However, some firms management use some available alternative accounting treatments to manipulate their earnings, this manipulation is to hide their financial situation to enhance management image and prevent any bad impact on their reputation, which leads to include incorrect financial data.

This manipulation is affected by some factors; one of these which have a significant impact is PCs, however, there are many alternative proxies to represent these PCs, Hence, this paper is interested in determining the effect of PCs proxies on income smoothing and ranking this effect, with concerning with Egyptian Stock Exchange (EGX).

Using a sample of Egyptian firms that were listed in EGX 30 from 2006 to 2015, the paper is interested in two questions; the first question is about the effect of PCs proxies on income

smoothing, the second question is about the effect Egyptian revolution 2011 on the association between PCs proxies and income smoothing.

The findings are represented in two points; the first finding indicates that all PCs proxies have an effect on income smoothing. The second finding refers to PCs effect ranking on income smoothing, which are firm size, then number of employees, then income tax rate, then government ownership. The third finding indicates that the Egyptian revolution 2011 has a negative and significant moderating effect on the association between firm size and income smoothing only.

In Egypt, paper provided two contributions which are; the first contribution determined the PCs proxies that have a significant effect on income smoothing. The second contribution is about the moderating effect of the Egyptian revolution 2011 on the association between PCs proxies and income smoothing which was significant for firm size.

For future researches in PCs field, they could concern with the tools to control PCs in developing countries or emerging markets.

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