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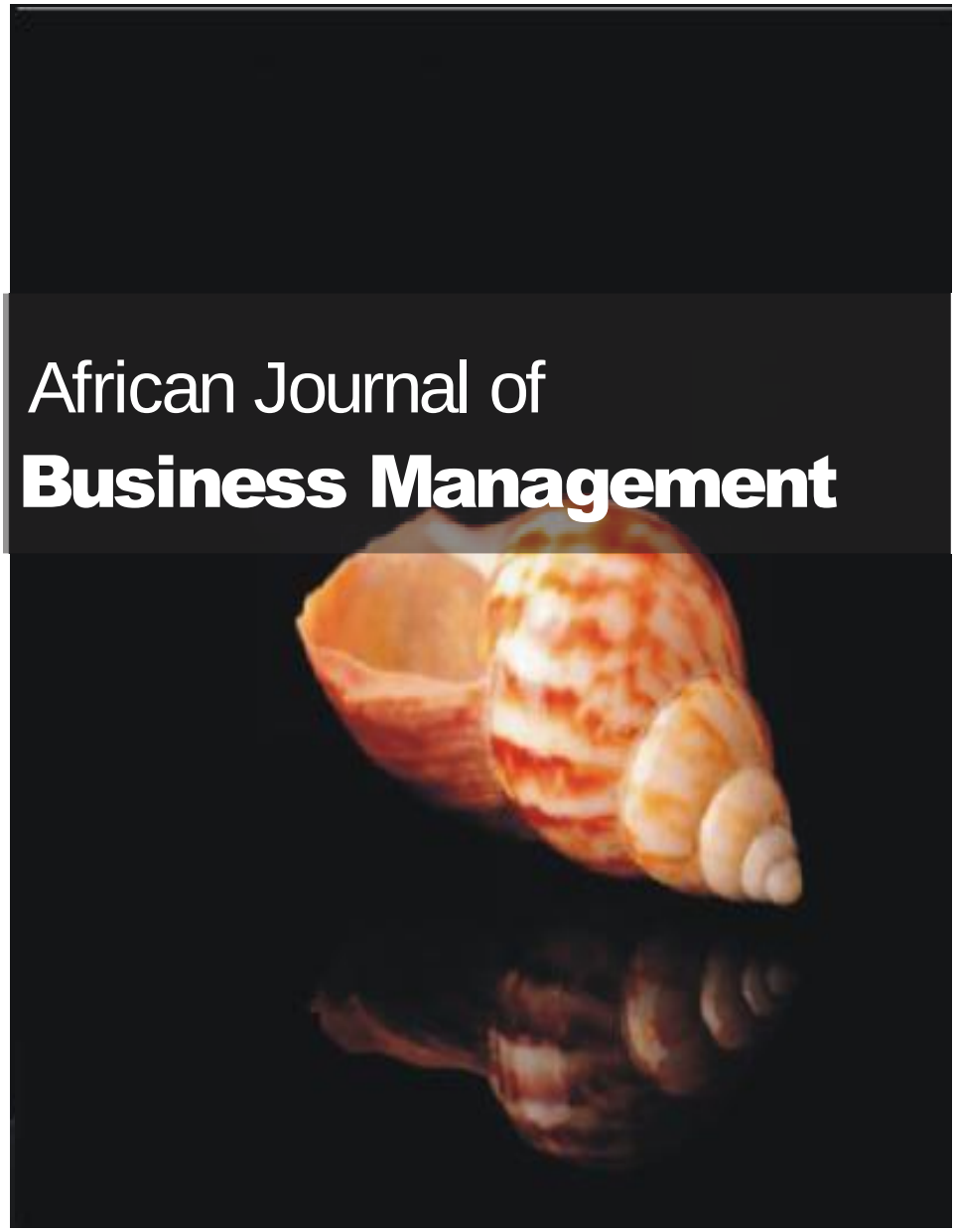

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Full Length Research Paper

Blue ocean strategies as panacea to sustainable performance of tea firms in Kenya

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Although tea is the leading cash crop in Kenya, the industry faces significant challenges. Although application of blue ocean strategy (BOS) could redress some of its problems, few studies have explored the question. This study investigated the relationship between BOS and sustainable performance of the Kenyan tea industry. The study applied the Four Action Framework (FAF) together with elements of Six Searching Paths-Frameworks (SSPF). The strategies resulting from SSPF were fashioned into the FAF, and validated by employees of tea estates in Nandi County. The sample consisted of 240 workers, selected from a target population of 1150, by stratified random sampling. The study found that all predictors in the regression model, eliminate (β=0.291), reduce (β=0.314), raise (β= 0.435), and create factors (β=0.344) had a significant and positive effect on sustainable performance. Thus, implementation of the four factors could lead to sustainable performance of Kenya's tea industry. The study concluded that branding tea, adding value to it, increasing domestic consumption, productivity and eliminating long and inefficient supply chain would lead to sustainable performance. The study recommends that the tea industry should add value and brand its tea.

Key words: Tea, blue ocean strategy (BOS), red ocean strategy (ROS), sustainable performance.

INTRODUCTION

Sustainable performance remains an overriding objective of many businesses. Sustainability is the incorporation of economic, environmental, and social value in a firm's business (Schoenmaker and Schramade, 2019). Because of its multidimensional nature, performance has defied a universal definition (Richard et al., 2009). According to Ahmed and Shaffiq (2014), organizational performance is associated with success and endurance of firm. They define it as the actual results/outcomes of an organization as measured against its targets. Organizational performance has been described as an organization's ability to acquire and utilize its scarce resources and valuables as expeditiously as possible in the pursuit of its strategic planning (Griffins, 2006; Richard et al., 2009). Coupling sustainability to performance, sustainable performance can thus be conceptualized as achieving

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successful outcomes that encapsulate economic, environmental and social aspects. Fechete and Nedelcu (2019) visualize sustainable performance as one concerned with simultaneous achievement of three categories of objectives: economic-financial, social and environmental. Sustainable performance therefore aims to create value for all stakeholders of a firm, namely, shareholders, employees, suppliers, customers, creditors and the local community. Businesses are forever competing, each striving to gain a competitive advantage over its rivals. Competitive advantage has been defined as the above industry average manifested exploitation of market opportunities and neutralization of competitive threats (Sigalas et al., 2013). The antecedents of competitive advantage have been cited as mobility barriers (factors that hinder the ability of firms to enter or exit industries), market positions and idiosyncratic firm resources (valuable, rare, inimitable and unsubstitutable financial, physical, human, relational resources) (Sigalas, 2015).

Traditionally, firms compete with the aim of capturing the largest market share, by focusing on differentiation, cost leadership, or focus (Porter, 1985; Thompson et al., 2008). Chan and Mauborgne (2004) upended this logic, arguing that companies could achieve sustainable performance by creating uncontested market spaces that render competition irrelevant. In a seminal book titled, 'Blue Ocean Strategy', Kim and Mauborgne (2005a) analyzed 150 companies within 30 industries over 100 years and concluded that there existed two types of markets, which they metaphorically termed, 'blue and red oceans'. Red oceans include all the extant industries, that is, the known market space, where industry boundaries are clear-cut and accepted, and the tenets of competition are known. They are characterized by fierce competition, shrinking market size, decreasing profits and growth, commodified products and cannibalized firms. This causes the ocean to turn 'bloody' and hence 'red oceans.' In contrast, blue oceans – referring to the vast and unexplored waters in an ocean – represent undiscovered and untapped market space, characterized by demand creation, highly profitable growth and no competition. Table 1 summarizes key differences between red ocean strategy (ROS) and blue ocean strategy (BOS).

BLUE OCEAN STRATEGY FRAMEWORK

The core BOS tools are the strategic canvas, consisting of a value curve, Six Searching Paths Framework (SSPF), Four Actions Framework (FAF) and Sequence of BOS (Kim and Mauborgne, 2005a). The first step is to conduct a business analysis, whose function is two-fold. First, it identifies factors which are taken for granted during competition, yielding a strategic canvas with an old value curve. A strategic canvas is a two-dimensional diagram, showing the range of factors that an industry competes on, on the horizontal axis, and the offering level that buyers receive for the named factors on the vertical axis. Joining the offering levels of all the factors using a line produces a value curve, a visual display of an organisation performance (Kim and Mauborgne, 2004).

Second, business analysis allows the identification of the most suitable searching path or their combination. To radically improve the old strategic canvas, the firm applies the FAF together with one or more SSPF. The SSPF is a detailed set of six methods that can be used to identify viable Blue Ocean ideas from a random mix of possibilities. The six searching paths are: 'look across alternative industries', 'look across strategic groups within industries', 'look across the chain of buyers', 'look across complimentary products and services', 'look across functional or emotional appeal to buyers', and 'look across time' (Kim and Mauborgne, 2004, 2005a, c). At least one of the six searching paths must apply in order to create a BOS. In the event that none of six paths are applicable, a BOS cannot be fashioned.

The Four Actions Framework (FAF) consisting of raise (factors a firm should increase well above the industry's norm), eliminate (those it should totally remove), reduce (those that must be decreased below the industry's), and create (innovations) is then applied to help derive an uncontested market space or value innovation (Kim and Mauborgne, 2004). The central plank of BOS is 'value innovation' – the simultaneous pursuit of differentiation and low cost - a notion anathema to the hitherto conventional logic of value-cost trade-off, in which a firm can either create higher value for customers at a higher cost or create reasonable value at a lower cost. The objective of value innovation is not to compete but to make competition irrelevant (Kim and Mauborgne, 2005a). In summary, the objective driving FAF is to increase the buyer's revenue and generate new demand (Leavy, 2005).

Tea, *Camellia sinensis*, is the leading cash crop in Kenya, with the country currently the world's third largest producer after China and India (Voora et al., 2019). Since 2009, the crop has been the country's highest foreign exchange earner, accounting for about 5 per cent of GDP (KIPPRA/ACBF, 2017) and supporting, directly and indirectly, over 10 million farm families in the country (FAO, 2015). Production of tea in Kenya occurs by a dual system, made of large and small-scale farmers. Whereas the former cultivate huge estates, they produce only about 40% of the tea, with the rest produced by about 600 000 smallholders, affiliated to KTDA (Kenya Tea Development Authority, 2017). The smallholder tea subsector has grown tremendously since its inception in 1962, with annual production rising from 0.6 million kg in

Table 1. Differences between ROS and BOS.

Dimension of strategy	ROS	BOS
Industry assumption	Conditions in industry are set	Conditions in industry can be shaped
Strategic focus	A firm must beat competition	A firm should make competition irrelevant
Market space	Compete in existing market space	Create uncontested market space
Strategic choice	A firm should pursue either differentiation or low cost	A firm should pursue both differentiation and low cost
Demand	A firm exploits existing demand	A firm creates and captures new demand

Source: Adapted from Kim and Mauborgne (2004; 2005a, b, c).

1962 to 218 million kg in 2012 whereas acreage under the crop has expanded from 4,471 to 120, 000 ha, over the same period (Mwaura et al., 2005).

Problem statement

Despite its preeminence in the economy, the Kenyan tea sector faces significant challenges. Kenyans consume only 5% of the tea they produce, exporting the rest, compared to a worldwide local consumption of about 60% (Ateka et al., 2018; van der Wal, 2008). Although Kenya's share of the world market increased from 6% in the 1970s to 26% in 2014, domestic consumption has stagnated at 5%. Secondly, Kenya's tea exports are heavily dependent upon five major export markets, namely, Egypt, Pakistan, United Kingdom, Sudan and Afghanistan (Wanjiru et al., 2015), some of which are unstable. Thus, any perturbation in any of these markets affects farmers' tea incomes.

Thirdly, having peaked in 2014, the current world market price for tea has stagnated and remained low, depressing farmers' incomes (Bolton, 2017). Kenya tea productivity in the smallholder subsector increased steadily in the 1960s to the 1980s. However, in the 1990s and 2000s, production stagnated and declined, with lower yield per hectare compared with plantation tea subsectors (Kamau, 2008).

Application of BOS by the Kenyan tea sector could redress some of its problems. By creating value innovation, sufficiently new products at lowered costs could be created. However, few studies have explored BOS with respect to the Kenyan tea sector.

General objective

The general objective of this study was to investigate the relationship between BOS and sustainable performance of the Kenyan tea industry.

Specific objectives

The specific objectives of this study were:

(i) To determine the effect of Eliminate factors on sustainable performance of the Kenyan tea industry
(ii) To establish the effect of Reduce factors on sustainable performance of the Kenyan tea industry
(iii) To determine the effect of Raise factors on sustainable performance of the Kenyan tea industry
(iv) To find out the effect of Create factors on sustainable performance of the Kenyan tea industry

Study hypotheses

The study tested the following null hypotheses for the specific objectives:

H_{o1}: Eliminate factors have no effect on sustainable performance of the Kenyan tea industry.
H_{o1}: Reduce factors do not affect sustainable performance of the Kenyan tea industry
H_{o1}: Raise factors have no effect on sustainable performance of the Kenyan tea industry
H_{o1}: Create factors do not affect sustainable performance of the Kenyan tea industry

EMPIRICAL REVIEW

Bataineh and Alomyan (2017) investigated the effect of blue ocean strategy in increasing competitive advantage in commercial banks of Irbid District, Jordan. Questionnaires were randomly distributed to 135 employees from three management levels within the banks. Results were analyzed using descriptive statistics and simple regression coefficient analysis. Findings indicated strong, significant and positive influence between (create new value, reducing cost, and raising facilitating actions) and competitive advantage. Mwende (2016) studied the effect of blue sea systems on

competitive advantage of microfinance institutions in Kenya. The study collected data from 52 institutions using questionnaires and analyzed using descriptive statistics and multiple linear regression. The study found that the key elements of BOS that are germane in explaining competitive advantage were: consumer loyalty, item separation, differentiation strategies, innovative delivery channels, and seeking customer feedback and promptly addressing them.

In Rawabdeh (2012)'s study, the BOS was applied to an industrial Jordanian firm owned by the private sector. The main results of this study indicate that the company was able to identify a number of new products that could lead to the development of new markets, particularly Blue Ocean markets. Moreover, Becker (2013) found that the IKEA Company in Nanjing, China, has applied the BOS successfully and that it is supported by the value of good innovation for both consumers and the company. It is a good example of the successful implementation of a global BOS.

Dehkordi et al. (2012) tried to shed light on the obstacles and constraints facing the application of BOS like simulation and imitation. The study compared the competitive environment (Red Ocean Strategy) to the BOS, and looked at the importance of the role of management in the use of BOS to increase revenues. It also showed the importance of innovation and its value in the application of this strategy, and in helping organizations to stay in the competitive market. It demonstrated the concept of the first and the second imitator as a crucial issue when considering this strategy and its mechanism of action in the market.

Kiptoon (2014) investigated the impact of BOS on the performance of Bamburi Cement Limited, a leading manufacturer of cement in East African region. Data were collected by interviewing the company's top management about its performance over a 15-year period. Findings showed that aggressive implementation of new value innovations significantly improved the organization's strategic position. However, the study found that BOS was insufficient in explaining growth in a rapidly evolving competitive environment. The study concluded that combining BOS with the ROS was pertinent in overcoming excessive competitive pressures.

MATERIALS AND METHODS

To apply the BOS, a strategy canvas was first created, in which the Kenyan tea industry performance was compared with two other prominent tea growers, Sri Lanka and Pakistan (Chen, 2020). This yielded a value curve. A strategic canvas is a two-dimensional diagram, showing the range of factors that an industry competes on, on the horizontal axis, and the offering level that buyers receive for the named factors on the vertical axis. Joining the offering levels of all the factors using a line produces a value curve, a visual display of an organisation performance (Kim and Mauborgne, 2004). Following literature review, this study determined five factors that could affect the competitiveness of the Kenyan tea industry, and therefore, its performance. These were domestic tea consumption (DTEACON), productivity/yield per hectare (PROD), export price of tea (EXPRC), branding (BRANDING) and tea farmer returns (FAMRETURNS).

The values representing the current assessment of the level of factors were plotted on the Y-axis. The ratings were quantified on a 0-to-5- point scale, representing absence, relatively low, low, medium, high, and relatively high, respectively. The source of the data was various websites and published reports about the Kenyan, Sri Lanka and Indian tea industries. In 2018, Kenyans consumed only 5% of the tea they produce (Chen, 2020). On the other hand, domestic consumption of tea in India and Sri Lanka is 81 and 11%, respectively (Tea Exporters Association, 2020). Consequently, the DTEACON scale, Kenya, India and Sri Lanka were rated as 0.25 (5/100*5), 4.05 and 0.55, respectively. Since, percentage tea exports were merely the converse of domestic consumption, they were not included in the analysis. Because of the predominance of smallholder farmers in Kenyan tea production, productivity in the three countries was compared using smallholder yield per hectare. In 2017, productivity in Kenya, India, and Sri Lanka was 2086.4, 2250 and 2123 kg/ha, respectively. Out of a possible maximal hectare production of 4500 kg/ha (Premaratne et al., 2018), the respective ratings of the three countries were 2.31 (2086.4/4500*5), 2.5, and 2.4, for Kenya, India and Sri Lanka, respectively, for PROD. In 2018, Sri Lankan tea fetched the highest export price (EXPRC) on the international market at 4.50 US$/Kg, followed by Indian (3.00 US$/Kg) and Kenyan (2.50 US$/Kg) teas (Intergovernmental Group on Tea (2018; Bolton, 2016). Sri Lankan tea was thus scored the highest (4.5/4.5*5 =5), followed by India (3.33) and Kenya (2.78).

Kenya brands (BRANDING) only 14% of its tea, exporting the rest in bulk form. On the other hand, Sri Lanka and India brand 57 and 60% of the tea they produce (Statista, 2019; KIPPRA/ACBF, 2017). Thus, on the scale, Kenya was rated 0.7 (14/100*5), while Sri Lanka and India were graded 2.85 and 3.0, respectively. Sri Lanka and India intervene to ensure that smallholders earn decent returns from tea by regulating the system of payments by private factories unlike Kenya. Sri Lanka implements a 68:32 revenue sharing ratio between smallholder and factory, with "tea inspectors" closely monitoring the price factories pay to farmers and what they receive from tea actions. India applies a 60:40 farmer to factory revenue sharing formula when the mean price for all types of tea reported by a factory in a specific month is either less than or equal to the monthly combined mean auction price for all types of tea in a region. When the price realized by the factory is more than the monthly average auction price, the differential is shared equally between the farmer and the factory. In Kenya, the returns to small-scale farmers remain low because of high management fees charged by KTDA, long and inefficient supply chain, mismanagement, numerous taxes imposed on farmers and the high cost of production (Ng'ang'a, 2015). Because of systems that ensure high farmer returns (FAMRETURNS), both Sri Lanka and India are rated 5 while Kenya is rated 1 because of their absence.

This study then applied the FAF together with elements of Six Searching Paths-Frameworks (SSPF), in order to improve the current strategic canvas for the Kenyan tea industry to make it more competitive. The elements of SSPF that were analyzed included looking across alternative industries, looking across the chain of buyers and looking across functional or emotional appeal to potentially create a Kenyan tea blue ocean (Kim and Mauborgne, 2004). The strategies resulting from SSPF were fashioned into the FAF, and put to employees of tea estates in Nandi County, a

bedrock of tea farming in Kenya, to seek their opinions.

Nandi County, located in the North Rift, covers an area of 2,884 km^2 and lies between latitude 0°6'13.04" N and longitude 35°10'39.56" E. The target population of the study was 1150 employees drawn from 10 registered Tea Estates in Nandi County, namely; Nandi Tea, Chemomi, Kibwari, Savani, Kipchomo, Siret, Kapchorua, Kapsubeiwa, Kipkoimet and Kaimosi. This region was chosen because it is one of the largest tea producing areas in the country (KTDA (2017). The study collected data from 240 respondents, according to the formula and correction for sampling from small population outlined in Noordzij et al. (2010). Stratified random sampling was used to select the respondents. To ensure a proportionate representation of all the tea estates in the study, the sample contributed by estate was weighted according to the estate's target population. A sampling frame of all the employees was obtained from general managers of each respective estate and used to select respondents using simple random sampling, which was accomplished with the help of a table of random numbers.

Questionnaire was used to collect data. The questionnaire was divided into two sections. Section 1 consisted of the respondents' biographical characteristics of gender, age and highest education level. Section 2 consisted of items covering the predictor variables: eliminate (three items), reduce (five items), raise (eight items) factors and create (four items), and the criterion variable, sustainable performance. Each item was measured on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).To test the reliability of the tool, alpha Cronbach consistency coefficient (Alpha) was computed. Field work was conducted from 10^{th} to 28^{th}, November, 2019. Data were described using frequencies. To establish the relationship between blue ocean strategies and sustainable performance, an Ordinary Least Squares (OLS) linear regression method was used. The study tested the following model:

$$Y= \beta_0+ \beta_1X_1+\beta_2X_2+ \beta_3X_3+ \beta_4X_4+ \varepsilon \quad (1)$$

Where Y is sustainable performance,
β_0 is the regression constant,
$\beta_1, \beta_2, \beta_3,$ and β_4 are the coefficients of independent variables to be estimated,
X_1 are eliminate factors
X_2 are reduce factors
X_3 are raise factors
X_4 are create factors
ε is an error term.

The core assumptions of OLS are as follows.

First, linearity asserts that the dependent variable is a linear function of a set of predictor variable and the error term. Secondly, disturbances have the same variance (homoscedastic) and are not related with one another (non-autocorrelated). Lastly, there is no exact linear relationship among independents, that is, no multicollinearity (Chatterjee and Simonoff, 2012; Greene, 2008). All statistical tests were two-tailed. Significant levels were measured at 95% confidence level with significant differences recorded at $p<0.05$.

RESULTS

Strategy canvas

Figure 1 presents the value curve for the Kenyan tea industry relative to those of Sri Lanka and India. The value curve shows that Kenya's tea industry performs the worst compared to India and Sri Lanka, in all the five competition factors investigated. Domestic tea consumption in Kenya is almost insignificant, suggesting that the country has a vast, untapped market. Although tea productivity of Kenya was roughly comparable to that of the other two countries in the study, it is less than a half of the possible maximal production, indicating that yields could be increased. Sri Lankan tea fetches almost twice in export price compared to Kenyan tea, showing deficiencies in the Kenyan tea model. Sri Lanka and India brand their tea about three times more than what Kenya does. Farm returns from tea in Kenya is quite low compared with India and Sri Lanka.

Sample characteristics of tea estate employees

The sample population was male dominated (with more than three quarters consisting of males) with middle-aged respondents (three out of every four participants was aged between 31 and 40 years) who worked in the tea estates (Table 2).

Male predominance in the labour force has been documented elsewhere (Comblon et al., 2017; Brixiová and Kangoye, 2016). About half of the sample had secondary education whereas less than a quarter possessed college or university education. The rest had either primary or no education. This suggested that though most of the respondents had modest education a few were well educated.

Descriptive statistics of the independent variables

Respondents' opinions on elements of the Four Actions Framework in the Kenyan tea industry were sought. First, were questions on the factors that ought to be eliminated. Most respondents (Table 3) were of the opinion that the following factors should be eliminated: long and inefficient supply chains (53 and 35% agreed or strongly agreed), mismanagement of tea factories (64 and 29% agreed or strongly agreed) and the many middlemen and brokers (69 and 22% agreed or strongly agreed). The respondents were asked about the factors that the Kenyan tea industry should reduce. Most respondents (Table 4) felt that KTDA should reduce management fees it charges farmers (42% and 52% agreed or strongly agreed), production costs of tea should reduce (42 and 50% agreed or strongly agreed), and diversify overseas markets (57 and 33% agreed or strongly agreed).

In addition, respondents also felt factories should reduce climate effects and bulk exports of tea. The

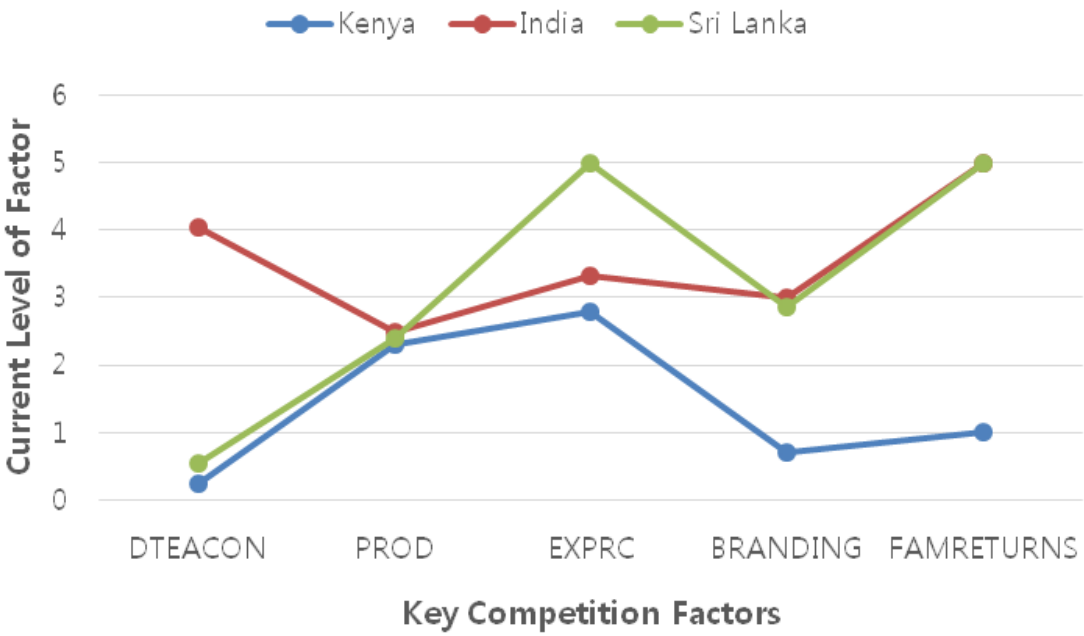

Figure 1. The current image of the Kenyan tea industry relative to India's and Sri Lanka's

Table 2. Respondents' characteristics.

Bio-graphic information	Categories	Frequency	Percent
Respondents' gender	Male	192	80
	Female	48	20
	Total	240	100
Respondent's age (years)	21-30	60	25
	31-40	167	69.6
	41-50	13	5.4
	Total	240	100
Highest education level	None	13	5.4
	Primary	67	28
	Secondary	132	55
	College	11	4.6
	University	17	7
	Total	240	100

Source: Primary data.

study also sought the opinions of respondents on factors the Kenyan tea industry should raise.

Most respondents felt that the industry should aim to make people drink tea in place of other substitutes such as soft drinks, water, coffee and alcohol (43 and 50% agreed and strongly agreed, respectively (Table 5). Many respondents also felt that the following factors should be raised: appeal to tomorrow's consumers, especially young people (58 and 30% agreed or strongly agreed), increase farmer roles in decision-making in factories (66

Table 3. Factors that should be eliminated from Kenyan tea industry.

Approach	SD		Disagree		Undecided		Agree		SA	
	Fq	%	Fq	%	Fq	%	Fq	%	Fq	%
Eliminate too many middlemen and brokers	8	3.4	13	5.2	0	0	166	69	54	22.4
Eliminate long and inefficient supply chain	0	0	25	10.3	4	1.7	128	53.4	83	34.5
Eliminate mismanagement of tea factories	8	3.4	8	3.4	0	0	153	63.8	71	29.3
Eliminate KTDA	50	21	94	39	48	20	27	11.3	21	8.7

S.D=strongly disagree, S.A=strongly agree, Fq=frequency; Cronbach's Alpha: 0.803
Source: Primary data.

Table 4. Factors that the Kenya tea industry should reduce.

Approach	SD		Disagree		Undecided		Agree		SA	
	Fq	%	Fq	%	Fq	%	Fq	%	Fq	%
Reduce overdependence on a few export markets	0	0	16	6.7	8	3.3	136	56.7	80	33.3
Reduce bulk exports of tea	12	5.1	37	15.3	44	18.6	114	47.5	33	13.6
Management fees charged by KTDA	0	0	0	0	16	6.7	100	41.7	124	51.7
Climate effects	4	1.7	56	23.3	23	9.6	88	36.7	69	28.7
Reduce production costs	0	0	8	3.3	12	5	100	41.7	120	50

S.D=strongly disagree, S.A=strongly agree, Fq=frequency. Cronbach's Alpha: 0.823.
Source: Primary data.

Table 5. Factors that should be raised in Kenyan tea industry.

Approach	SD		Disagree		Undecided		Agree		SA	
	Fq	%	Fq	%	Fq	%	Fq	%	Fq	%
Appeal to tomorrow's consumers	12	5	12	5	4	1.7	140	58.3	72	30
Improve the quality of tea	4	1.7	16	6.7	16	6.7	132	55	72	30
Increase the quantity of tea bought by better marketing	0	0	28	11.7	28	11.7	124	51.7	60	25
Increase domestic consumption of tea	0	0	33	13.6	16	6.8	171	71.2	20	8.5
Increase farmer roles in decision-making in factories	8	3.4	4	1.7	16	6.8	159	66.1	53	22
Make drinking tea an experience or luxury	0	0	40	16.7	24	10	128	53.3	48	20
Substitute tea for other drinks e.g. soda, beer, water, coffee e.t.c.	0	0	0	0	16	6.7	104	43.3	120	50
Increase tea productivity per hectare	0	0	16	6.8	33	13.6	118	49.2	73	30.5

S.D=strongly disagree, S.A=strongly agree, Fq=frequency. Cronbach's Alpha: 0.845.
Source: Primary data.

and 22% agreed or strongly agreed) and improve the quality of tea produced (55 and 30% agreed or strongly agreed).

They also felt strongly that factories should implement better marketing to increase the quantity of tea sold, increase domestic consumption of tea, increase productivity of tea per hectare and make drinking tea unforgettable experience.

Furthermore, they were asked on what the Kenyan tea industry should create. Most of them (Table 6) averred that the industry should brand its tea before exporting (45 and 55% agreed or strongly agreed), add value to the tea, for instance by making green and herbal teas (49 and 31% agreed or strongly agreed), and use larger packing (47 and 25% agreed or strongly agreed). Lastly, the study sought respondents' opinions on how the above factors (BOS) could potentially lead to sustainable performance. Most of them (Table 7) opined that BOS

Table 6. Factors that the Kenya tea industry should create.

Approach	SD		Disagree		Undecided		Agree		SA	
	Fq	%	Fq	%	Fq	%	Fq	%	Fq	%
Brand the tea for export	0	0	0	0	0	0	108	45	132	55
Use larger packing	0	0	24	10	44	18.3	112	46.7	60	25
Add value to the tea e.g. making green and herbal teas	0	0	16	6.8	33	13.6	118	49.2	73	30.5
Single origin	0	0	24	10	32	13.3	128	53.3	56	23.3

S.D=strongly disagree, S.A=strongly agree, Fq=frequency; Cronbach's Alpha: 0.901.
Source: Primary data.

Table 7. Sustainable performance.

Approach	SD		Disagree		Undecided		Agree		SA	
	Fq	%	Fq	%	Fq	%	Fq	%	Fq	%
BOS lead to economic prosperity of tea farmers and factories	0	0	37	15.5	25	10.3	104	43.1	74	31
BOS leads to social equity	4	1.7	40	16.7	24	10	124	51.7	48	20
BOS leads to better environmental protection	16	6.8	61	25.4	20	8.5	118	49.2	25	10.2

S.D=strongly disagree, S.A=strongly agree, Fq=frequency; Cronbach's Alpha: 0.78.**Source:** Primary data

lead to economic prosperity of both tea farmers and factories (43 and 31% agreed or strongly agreed) and social equity (52 and 20% agreed or strongly agreed). They also believed that BOS also leads to better environmental protection (49% and 10% agreed or strongly agreed).

OLS regression analysis

First, the assumptions of OLS regression were tested. The highest Cook's distance was 0.102 while the maximum leverage value was 0.276, which was less than one and two, respectively. This indicated that no single case exerted undue influence on regression coefficients, hence, there were likely to be no extreme outliers in the data. Homoscedasticity was examined via several scatterplots and these indicated reasonable consistency of spread through the distributions. The Durbin-Watson statistic was 1.796, which was between one and three, suggesting that the errors were not correlated. Correlations amongst the independents were positive but moderate (minimum = 0.105, maximum 0.612). In addition, tolerance values for all the independent variables ranged between 0.541 and 0.803. These indicated that multicollinearity was unlikely to be a problem. The predictors had moderate correlation with the dependent variable which indicated that the data were suitable for examination through multiple linear regression. The results of the OLS linear regression are presented in Table 8. The estimated equation for the linear model can thus be written as:

$$\text{Sustainable Performance} = -1.041 + 0.291*\text{Eliminate} + 0.314*\text{Reduce} + 0.435*\text{Raise} + 0.344*\text{Create} + \varepsilon \quad (2)$$

The β coefficients for all the predictors were significant and positive, implying that an increase in any of them would likely increase sustainable performance of the Kenyan tea industry. This suggested that the four independent variables were significant predictors of performance. For instance, the coefficient for Eliminate factors was 0.291, which means that when these factors are eliminated by one unit on its scale, sustainable performance increases by 8% (coefficient of determination = $r^2 = 0.291^2$). Since the beta coefficient of Create factors (β=0.314) is the greatest in magnitude, increase in these factors will have the greatest effect on sustainable performance, followed by Raise factors (β=0.251, Eliminate (β=0.241), and lastly, Reduce factors (β=0.221). For example, for an increase of one standard deviation in Create factors will increase sustainable performance by roughly 0.314 of its standard deviation. R^2 in this model was 0.492. Thus, the four predictors could explain roughly

Table 8. Results of OLS regression on effects of BOS on sustainable performance.

Variable	Coefficients (SE)	t - value	Beta
Constant(C)	-1.041 (0.607)	-1.715	
Eliminate	0.291 (0.136)	2.131**	0.241
Reduce	0.314 (0.144)	2.182**	0.221
Raise	0.435 (0.147)	2.962***	0.251
Create	0.344 (0.087)	3.943***	0.314
R^2	0.492		
F- Value	21.279***		
Adjusted R^2	0.469		

SE = standard error. *, **, and *** = t value significant at the ten, five and one percent levels of probability, respectively.
Source: Primary data.

a half of the variance in sustainable performance, which was relatively high (Field, 2005). The remaining unexplained variation could be attributed to other factors not specified in the model and to the error term in the regression equation. If this model had been derived from the population rather than the sample, then it would have accounted for approximately 47% of the variance in the dependent variable, which is just about 2.3% less than what the model explains.

DISCUSSION

The study's regression model suggests that implementation of the four factors could lead to sustainable performance of Kenya's tea industry. Respondents felt the industry has too many middlemen and brokers, who end up eating the revenue meant for farmers after selling tea. The tea supply chain in Kenya, from the farmer to the consumer, has been found to be extraordinarily long, with as many as 12 cost centres all eating revenue that should accrue to farmers (Monroy et al., 2013). This was seen on Kenya's value curve, which had the lowest tea farm returns compared to Sri Lanka and India. Kamau (2019) reported that smallholder tea farmers receive only 16 per cent of the consumer price paid in European markets while the rest is shared between brokers, marketers, traders, and bureaucrats. However, many participants rejected the elimination of KTDA, recognizing the unique role it plays from cultivation of tea, extension, transport, processing, warehousing, marketing and procurement of inputs (Monroy et al., 2013). For instance, KTDA adopted a singular policy of plucking only the top two leaves and a bud, resulting in a quality of tea that has been unmatched anywhere in the world. Nevertheless, respondents felt tea factories should eliminate mismanagement. Studies have shown that KTDA does not allow factories to have free and fair elections; instead, it micromanages them, ensuring that elected directors are partial to it (Kamau, 2019).

The study also showed that management fees charged by KTDA are too high. This is consistent with findings by Kamau (2019), who showed that farmers only get 40% of their tea revenues, with the rest used to run factories, bureaucracy and the elongated value chain. For instance, of the Ksh 74 that a kilo of tea was sold in 2019, farmers only got Kshs 29. Respondents also wanted the reduction of bulk exports of tea and overdependence on a few export markets. This was in tandem with findings by Bolton (2017) and van der Wal (2008). The participants also felt production costs and climate effects should be reduced. Authors like Ateka et al. (2018) and Amde et al. (2009) have illustrated the steep costs in tea production, driven by skyrocketing energy costs, high cost of inputs, especially fertilisers and labour and high inflation, which further reduces farmers' income. Climate change effects, such as cold, inadequate precipitation, frost and hail have been found to adversely affect all activities of tea growing, from land preparation, plucking, processing and drying (UNIDO, 2017).

Factors that the tea industry should raise mostly aimed at improving domestic consumption, which was low on the value curve. For instance, respondents felt that tea should be promoted to an extent it substitutes other drinks that Kenyans use to relax and stimulate, such as soda, beer, water, coffee, chocolate and milk. Others want the industry to make selling tea an emotional and luxurious experience, akin to the coffee house, Starbucks. It could do so by setting up unique cafes, where customers could relax and drink customised tea prepared right in front of them. The industry could also

appeal to younger people/tomorrow's consumers, who do not find it fashionable consuming tea, as it is not 'cool'. They would rather drink 'Cappuchino', 'Caffelate' coffee, and other beverages instead (Afande, 2015). Factories should also improve the quality of tea and increase the quantity bought through better marketing. Gikunju et al. (2019) demonstrated a positive and significant relationship between various marketing strategies and performance of the tea industry in Mount Kenya Region.

Branding and adding value to tea were the most cited factors with respect to creation. The value curve showed that compared with Sri Lanka and India, Kenya is poor in branding its tea, exporting most of it in bulk form. Consequently, although Kenya exports more tea than any other country, it receives lower earnings. For example, in 2013, although Kenya exported 131 metric tonnes more than Sri Lanka, it earned 300 million dollars less (KIPPRA/ACBF, 2017). Despite many years, the country has continued to produce tea with little product differentiation and value addition, which has limited revenue. Branded, pure Kenyan blended tea could include herbal tea, green tea, flavoured tea, such as lemon, ginger, chamomile, and peppermint instead of the usual black tea (Wanjiru et al., 2015). The regression model predicts that create factors are likely to cause the greatest effect on sustainable performance, followed by raise factors. This suggests that the tea industry should urgently implement these factors, followed by eliminate and reduce factors.

CONCLUSIONS AND RECOMMENDATIONS

This study investigated the relationship between BOS and sustainable performance of the Kenyan tea industry. The current strategy canvas showed that compared to India and Sri Lanka, the Kenyan tea industry competes poorly with respect to domestic tea consumption, branding and farmer returns. The study's regression model suggested that implementation of the four factors could lead to sustainable performance of Kenya's tea industry. Specifically, eliminating the many brokers and middlemen, long and inefficient supply chain and mismanagement will improve performance so will be the reduction of overdependence on a few export markets, bulk exports, management and production costs, and climate effects. The model predicts that raising domestic tea consumption, quality of tea, farmer roles and productivity and branding and value addition leads to sustainable performance. To ensure sustainable performance, the tea industry should add value and brand tea. It should also increase domestic consumption, productivity, reduce the supply chain and improve management of factories. Since BOS could explain about a half of the variation in sustainable performance, this study suggests that further studies could be conducted in other sectors to explore the effect of these strategies on performance.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Moderating effect of organization culture on the relationship between quality management system adoption and performance of public universities in Kenya

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The capacity of higher education institutions (HEIs) to serve as drivers to economic competitiveness has been negatively impacted due to the exponential growth and numerous constraints which interfere with their quality. In Kenya, HEIs, in their attempt to cater for the 28% increase in number of students, 6% government capitation cut and 14.3% of the 28 weeks, academic year time waste between 2014 and 2015, have encountered many challenges caused by overcrowding, crumbling infrastructure, inadequate human capital with 1:500 lecturers to student ratio and financial resources and declining quality of the professional courses on offer. They have raised concerns about the quality of public university education. The aim of this study is to analyze the effect of organization culture on the relationship between Quality Management System (QMS) adoption and organization performance of public universities in Kenya. The study was guided by structural contingency theory and equity theory; using a census survey with a Bureau of Standards. The study results revealed organization culture (β=0.492 p=0.030) moderated the relationship significantly implying the interactive effect of organization culture improved organization Performance by 0.7% (Δ R2 .007p=0.030). The study concluded that organization culture increases the effect of QMS adoption on organizational performance. response at 94.41% on a population 215 top management personnel of 11 public universities certified by the Kenya

Key words: Quality Management System (QMS), Universities, organizational culture, performance.

INTRODUCTION

Education plays a critical role in the overall development of a country's economy (Ali and Rahmat. 2010) and cannot be underestimated. However, the global demand in education has led to the development of both private and public owned educational institutions (Mathooko, 2013). Education is no longer a luxury but it is essential for one 'survival. As competition intensifies in businesses worldwide due to changes in business structure and the

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emergence of new technologies, education policy-makers in developing countries are worried about the poor state of their higher education institutions. From the historical development of higher education institutions in Africa, universities have been the main problems (Chang'ach, 2014).

As a developing country and the increase in demand of education in Kenya, Higher education has faced a significant and persistent pressure towards expansion in recent years, and this trend has led to substantial economic and academic challenges for both higher education institutions and the government. According to Mathooko (2013) and Otieno (2010), the historical experience of the development of the university system in Kenya is similar to the situations faced in most developing countries concerning the basic orientation reflecting the influence of the colonial forces. They were established as part of the countries' education systems on the premise of supplying labor to maintain existing industrial facilities developed during the colonial period (Chang'ach, 2014). However, Higher education stakeholders are continually questioning the value of the products the higher education institutions in Kenya are presenting to the market and why foreign universities remain attractive.

According to Alsubait et al. (2014), higher education institutions in African countries play a more significant role in national development than they do in other parts of the world. They are the only institutions with some capacity to undertake research and generate the knowledge required for development. This has led to the development of both publicly owned and privately owned institutions. However, private institutions, irrespective of their levels of status and accreditation stages, have been a significant threat to the public institutions for long. Otieno (2010) and Mathooko (2013) noted that as Kenyan Universities seek to offset declining state of dollar and constant increase in students there has been an incredible increase in university branches and constituent colleges. With the introduction of the double-entry system (2011), students' enrolment in these institutions stood at 539,749 (2015), with public universities accounting for 461,820 students and private universities having 77,929 students. This has put pressure on the government to create jobs for graduates whose number stood at62,000 in 2002 depicting a 28% increase in the number of students in 2014/2015.

Higher education in Kenya has been facing significant and persistent pressures towards expansion in recent years, and this trend has led to substantial economic and academic challenges for both higher education institutions and the government. Moreover, several factors have contributed to raising public concern over the quality of education, leading to the emergence of quality measurement and improvement devices such as performance indicators, accreditation, programmes, institutional assessment and quality audits. Mathooko (2013) stated that public universities are subjected to quality assurance overseen by the Commission for University Education (CUE) aimed at streamlining and improving the management of university affairs.

With increasing market competition and limited funding opportunities, universities have to adopt business-like strategies to cope with the changing world economy (Arjomandi et al., 2009). Concerning this, Arjomandi et al (2009) believes that universities should be considered as business entities. Universities are in a competitive environment with limited funding and resources while they have to generate extra cost to curb its deficit. Unlike other organizations, universities need to be productive, as they have to attract students to fulfil both their goals and funding needs. According to Simmons and White (1999), organizations adopt QMS to differentiate themselves from the competition and to improve their image. Moreover, Dia (2000)'s study found out that quality assurance has become a powerful strategic weapon in international competition and trade. Dia supports Simmons and white (1999)'s studies since he stated that improved quality reduces waste and increases productivity. Further improvement in quality and productivity enables firms to increase their market share and to charge higher prices for their products. This in turn results in higher profitability hence strengthening their competitive position.

The world of education is experiencing rapid changes and will probably face even more significant changes in the future (Otieno, 2010; Dia, 2000; Mathooko, 2013). Higher education stakeholders are continually questioning the value of the products the higher education institutions in Kenya are presenting to the market and why foreign universities remain attractive. The same issues could be identified in other African states. On his report dated 2015, President Uhuru Kenyatta agreed that there was a need to allocate more resources to public universities to enhance research and innovation. However, the report of Commission of University Education dated 2015 stipulated that most universities in Kenya have not evolved to address the challenges of the current job markets and have failed to provide contemporary quality programmes to take advantage of emerging technology opportunities. This exists irrespective of the Ksh. 19,814.28 deficit and 6% cut findings towards higher education to US$ 588 million compared to the US$ 627.2 million allotted in 2014/2015.

As governments in most parts of the world are focusing on higher education over the last decades, Kenyan public universities now focus on quality assurance and quality enhancement. Most of the teachers tend to teach both regular and self-sponsored students which are not really or fully qualified to do (Mwiria, 2007). The study stated that 14.3% of 28 weeks per academic year are wasted in the universities due to the adoption of the semester system and the shuttling character of some lecturers between campuses of the same institution and/or other

universities. This has triggered a major exodus of students to foreign destinations, in search of quality education due to inefficiency in time utilization and use of inferior methods of content coverage; they only focus on areas that they intend to examine at the end of the semester in the universities

The quality management system, which is well embedded in business organizations and industries, is now being used in the higher education institution sector where it was developed and adapted (Deming, 1986).. It is a powerful strategy in international competition and trade and enables firms to increase their market share and profitability (Dobrzański and Roszak, 2007; Mizikaci, 2006). To Sriram and Mersha (2006), quality competitiveness and development in sub-Saharan Africa has enhanced the growth of service and manufacturing institutions. Boiral (2007) state that the business impact of Quality Management System certification makes it reasonable to assume that Quality Management System benefits improve organizational effectiveness; and that positive effects of certification relate to management willingness to make Quality Management System a useful tool for enhancing quality practices. However, Grant et al. (2004), Yilmaz (2010), Blackmore (2004) and Harvey and Stensaker (2008) postulate that due to the complex nature of higher education based on its diverse stakeholders, they tend to impose different views on organizational effectiveness based on Quality Management System and are obliged to comply with regulatory requirements for transparency in governance and financial management (Makawiti, 2011; Gaither, 1998; Lee. et al, 2006).

Quality is a widely used concept that has become one of the essential agendas in most organizations. Quality enables them to compete and face the challenging forces of globalization. Global competition requires organizations across borders to initiate efforts to ensure their products and services achieve the highest quality standard. Most empirical works agree that adoption of a quality management model by organizations could be considered as a potential source of competitive advantage and value-generating. Anecdotal evidence suggests that organizations can achieve internal benefits such as quality or productivity improvements, or that certification can help firms maintain or increase their market share or both. Others argue that the standard is too generic to cause performance improvement, but as a signal of proper management. The use of a moderator can either positively or negatively influence organizational performance.

The studies of Dahlgren and Mahmood (2014), Prajogo and Sohal (2003), and Sanders and Linderman (2014) were similar in the sense that a moderation study was carried out in a survey research design on manufacturing firms. The findings of these studies revealed positive and statistical significant moderation effects. Wanyoike. (2016)'s study anchored on Quality improvement theory and institutional theory revealed a moderated mediation effect on the relationship between Quality Management System and organizational performance. Further, the studies of Hussain and Younis (2015) and Din et al. (2011) on Quality Management System and organization performance revealed a positive moderation effect. However, Roldán et al. (2017)'s study showed a negative moderation effect of quality management on open innovation performance. Iqbal et al. (2012)'s findings revealed a mix reaction in that there was a strong and positive association between TQM practice and quality performance, innovation performance and organizational performance and culture of support had a moderating role in the relationship between TQM practice and organizational performance. These studies though revealed a positive, negative and mixed reaction on quality management system and performance; they focused on service institutions, used a survey research design on service industries in the developed countries and were limited to ICT telecommunication and Health institutions. Quality Management System as a new culture in the existing organization culture can influence performance. There is no known information on how organizational culture as a moderator affects Quality Management System adoption on return in service institutions, especially in developing countries Higher Education institutions. Based on Quality Management System and performance, as study variables organization culture, was adopted as a moderator variable this was due to the increase in globalization, more interaction among individuals from a diverse cultural perspective is needed for organization competitive advantage. Moreover, the maximization and capitalization of diversity in a work environment have become an essential issue for management in developing countries, and the culture of any organization is a significant factor in its success or failure. The role of organizational culture as a moderator variable can have an effect on performance; it is the glue that combines the non-human resources to that of human resources in organizations to establish teamwork and excellent execution. It needs an investigation in the higher learning institutions.

LITERATURE REVIEW

Mahmood and Ahmed (2014), in their study on 396 textile manufacturing firms, observed that two of the four dimensions of TQM (continuous improvement and employees' involvement) had a positive and significant impact on organizational performance. The other two aspects (customer focus and top management support) had insignificant relation with organizational performance. Mahmood and Ahmed (2014) also found out that continuous improvement significantly and positively affects organizational performance and the relationship of employees' involvement with organizational performance

is also positive and statistically significant. The study concluded that for an organization to transform quality certifications into performance enhancement; changes are monitored with several types of data. In a survey in Australian industries, a structural equation modelling technique was adopted on 174 managers, Prajogo and Sohal (2003) found that TQM significantly and positively relates to both product quality and product innovation performance. However, it appeared that the magnitude of the relationship was greater against product quality. Besides, the significant causal relationship between quality performance and innovation performance was found, suggesting that the achievement of one aspect of performance could impact the other. Kontoghiorghes (2016) used structural equation modelling technique on a sample of 897 automotive supply chain employees of a full-service supply chain management company operating in the southwestern United States. The study revealed that strategically aligned and ethical high performance, organizational culture has a strong effect on talent attraction and retention. Prajogo and Sohal (2003) and Kontoghiorghes (2016)'s study, therefore, concentrated on the use of structural equation modelling technique; the study did not explore how the factors moderated the organizational performance being employed by TQM in the automobile industry.

Wanyoike (2016) conducted a study to establish the effect of quality management practices on the performance of manufacturing firms in Kenya. A census survey was adopted on 60 manufacturing firms in Kenya. Anchored on Quality improvement theory and Institutional theory, the study focused on two objectives; assess the moderating effect of the operating environment on the relationship between quality management practices and performance and to establish the mediating effect of organizational capability on the relationship between quality management practices and performance. The study revealed that organizational capability partially mediated the relationship between quality management practices and performance. Further, the study results on the moderated effects of operating environment and performance showed a positive and statistically significant relationship, thus implying that the working environment is having a moderating impact on the relationship between quality management practices and performance. The study adopted a cross-sectional survey approach.

Sanders and Linderman (2014) also carried a survey of 239 manufacturing firms. From their study, the performance was measured by efficiency and innovation. The study revealed that the influence of process design on productivity and innovation, performance is not dependent on competitive intensity. However, the impact of process improvement and process control on efficiency and innovation performance is, in some instance, moderated by competitive intensity. Moreover, Hussain and Younis (2015) surveyed the synergic impact of leadership in cultivating the organizational performance outcomes of quality management practices in Pakistan. Using a multiple regression model, the study revealed that there was a Partial moderation between organizational performance and construct of quality management practices. Hussain and Younis (2015) and Sanders and Linderman (2014)'s studies were anchored on survey study design. Moreover, Hussain and Younis (2015)'s study focused on pharmaceutical firms in Pakistan, while Sanders and Linderman (2014) focused on manufacturing firms. The current study will be anchored on a descriptive survey on public universities in Kenya.

A survey study by Din et al. (2011) explored the relationship between an ISO 9000 certified quality management system (QMS) and elements of performance in construction project environments. The study explored three elements of performance: project management practices, financial management practices and Project Success. The study indicated that ISO 9000 certification had a positive moderating effect on the casual relationship between project management Practices and Project Success. Based on the survey results, a Project Management Performance Assessment for Construction model is developed, which extends the Project Management Performance Assessment to include performance enablers linked to financial management activities. The survey was limited to the construction sector in Malaysia.

Roldán et al. (2017) did a research on moderating role of an inter-organizational IT infrastructure and the complementarily of learning styles among an organization committed to quality improvement and its supply network from 270 managers of European firms. The study revealed the adverse effects of quality management on open innovation performance. However, this could be overcome by complementing the organization's learning style with that of its open innovation partner, particularly, its supply network, and, most importantly, obtaining information technologies compatible with those of its supply network members.

Demirbag et al. (2006), based on their research on financial performance, observed that there was a significant relationship between TQM practices and internal and external failure and firms' performance. Customer focus and participation are essential predictors for internal failure. The study also found out that Customer focus and quality system moderates the relationship between TQM implementation and organizational performance. Moreover, customer focus and quality system is found to be significant predictors for external organization failure. In contrast, some of the internal and external failure elements are particularly strong predictors of firms' performance.

Valmohammadi and Kalantari (2015) conducted a survey study on the moderating effect of motivations on the relationship between obtaining ISO 9001 certification

and organizational performance using a structural equation model. The study revealed that motivations, especially internal motivations, have a significant effect on the performance of the surveyed companies. This leads companies toward building competitive capabilities which eventually appears in their performance. The study results demonstrate that ISO 9001 certified companies show better organizational performance than non-certified ISO 9001 companies, and internal motivations moderate an organization in obtaining ISO 9001 certificate and performance. The study was restricted to only a single region and manufacturing and the data collected was cross-sectional. Moreover, the study findings revealed that large organizations have better knowledge management capabilities compared to the medium organizations

Iqbal et al. (2012) studied the effect of TQM practices on the performance of the telecom sector of Pakistan. The study found that innovation performance had a partial mediating impact between TQM and organization performance, whereas, quality practice mediation impact was not established. Moreover, the culture of support had a moderating role in the relationship between TQM practices and organizational performance. The study was only limited to the telecom industry of Pakistan, and the study sample size was limited due to time.

The studies of Mahmood and Ahmed (2014), Prajogo and Sohal (2003), and Sanders and Linderman (2014) were similar in the sense that a moderation study was carried out in a survey research design on manufacturing firms. The findings of these studies revealed positive and statistical significant moderation effects. In support Wanyoike (2016)'s study anchored on Quality improvement theory and institutional theory revealed a moderated mediation effect on the relationship between Quality Management System and organizational performance. Further, Hussain and Younis (2015), and Din et al. (2011)'s studies on Quality Management System and organizational performance revealed a positive moderation effect. However, Roldán et al. (2017)'s study showed a negative moderation effect. These studies, though focused on service institutions, used a survey research design on service industries in the developed countries and were limited to ICT telecommunication and Health institutions. Quality Management System as a new culture in the existing organizational culture can influence performance.

METHODOLOGY

The study adopts a correlation design. Correlation research design aims to ascertain if there are significant associations between study Variables (Kothari, 2004), on 11 public universities in Kenya who attained QMS certification through KEBS. A target population is that group of people from whom the study is designed, and generalizations of the findings are made from (Kothari, 2004). The study unit of analysis will entail organization management personnel in 11 public universities. This will not include the other subsidiaries either operating under the principal university umbrella or name.

A census survey approach was adopted and a sample frame obtained from the 215 management Personnel based on 11 vice-chancellors, 38 deputy vice-chancellors, 11 finance officers, 25 registrars, 106 deans and 11 librarians. Primary data were collected using questionnaires from senior and top managers. The study much preferred inquiries since they can be used to gather data in a short period and within the minimum expense.

The study sought to analyze the moderating effect of Organizational Culture on the relationship between Quality Management System adoption and organizational performance. The simple rule is that the components of any product must always be included when testing the moderator effect (Cohen, 1991). According to Cohen (1991), the model for moderator analysis is not additive as in the case of other regression models, and the product represents the interaction only when its components have been partial out. For this reason, they are interpreting the coefficients in the model based on un-standardized coefficients rather than the standardized coefficients (Whisman and McClelland, 2005).The study adopted a moderator analysis to determine the relationship between explanatory variables; Organizational culture and Quality Management System adoption and; the dependent variable is organizational performance.

Additive model: $Y_i = \beta_0 + \beta_1 X_i + \beta_2 Z_i + e$ (1)

Where $Z_i$is a moderator variable organizational culture.

This model introduces organizational culture as a moderator to establish its contribution to organizational performance.

Moderator model: $Y_i = b_0 + b_1 Xi + b_2 Zi + b_3 ZiX_i + e$ (2)

Moderator model: $Y_i = (b_0 + b_2 Zi) + (b_1 + b_3 Zi)\ X_i$ (3)

Where ZiX_i, is the cross product of the interaction term (organizational culture and Quality Management System adoption). This model encompasses the dependent and independent, the potential moderating variable and the cross product interaction term of the dependent variable and potential moderating variable (Source: Adapted from Aiken et al., 1991);

Y: Dependent variable (Organizational Performance)
X: Independent variable (Quality Management System adoption)
Z: Moderator variable (organizational culture)
XZ: interaction term (organizational culture and Quality Management System adoption)
β_0: Standardized Y-intercept in the additive model (model without the interaction term)
β_1: Standardized coefficient of X in the additive model
β_2: Standardized coefficient of X in the additive model
b_1:Un-Standardized coefficient of X in the moderator model (Main effect of X on Y if Z is zero or simple effect of X on Y if Z is above zero).
b_2:Un-Standardized coefficient of Z in the moderator model (Simple effect of Z on Y)
b_3:Un-Standardized coefficient of XZ in the moderator model (The interaction measures for moderation)
*e:*is residual in the equation which is assumed to be identically and independently distributed with zero mean and constant variance
$(b_0 + b_2 Zi)$*:* The Y-intercept of the moderator model
$(b_1 + b_3 Zi)$: The slope of Y to X for different values of Z.

Equation 3 represents the linear functional form with $(b_0 + b_2 Zi)$ representing the intercept and $(b_1 + b_3 Zi)$ representing the slope of Y_i to X_i; therefore at different values Z, Y_i to X_i slope is expected to have different values. The moderator coefficients were expressed

as *b* because their interpretation is supposed to be based on un-standardized values.

RESULTS AND DISCUSSION

The study target population was 215 out of which 45 were used for piloting, and were administered to the university management to participate in the study. From this total, data were recovered from 210 respondents, or questionnaires, out of which seven did were not adequately filled and were dropped. The final response was 203 questionnaires, which gives a response return of 94.41%, from which 38 was used for piloting.

The final objective of the study was to establish the moderating effect of organizational culture on Quality Management System adoption and organizational performance on public universities in Kenya. The study hypothesis is, “Organizational culture does not have a significant moderating effect on the relationship between Quality Management System adoption and organization performance on public universities in Kenya". Three steps were taken to achieve the objective. First, an interaction term was computed. The interaction term was between the independent variable (Quality Management System adoption) and the moderator variable (organizational culture). An overview of the descriptive statistics measuring the means and standard deviations of the three variables included in the model was then presented. These include the dependent variable (organizational performance), the independent variable (quality management system adoption) and finally, the interaction between Quality Management System Adoption and organizational culture. The results are presented in Table 1.

From the findings in Table 1, the overall sample response remained 165. The minimum and maximum means for the organizational performance and organizational culture were 2.01-4.73 and 1.73-4.60, respectively. For the organizational culture, the mean range was 5.42-21.69. The actual mean for organizational performance was high (M=3.45, SD=0.60); that for organizational culture slightly higher (M=3.49, SD=0.63) while that of the interaction term was much high (M=12.71, SD=4.06) since it was attained after multiplying the mean scores of the dependent and independent variables.

For the objective, testing the null hypothesis was stated as H_o: β_i =0. There are no significant moderating effects of organization culture on Quality Management System adoption and organizational performance on public universities in Kenya. This hypothesis was tested and actualized by use of Multiple Regression Analysis (MRA). The study tested the interaction between quality management system adoption and organizational culture. This procedure involved hierarchical regression which entailed entering the mean composite quality management system adoption and meant corporate culture in step 1, and then introducing the interaction variable (which is the cross product between quality management system adoption and Quality organizational culture) in step 2. To reduce threats of multi-collinearity by reducing the size of any high correlation of service quality and quality management practices with the new interaction, standardized values were used for the interaction variable.

Table 2 shows the standardized (β) and un-standardized (β) coefficients for quality management system adoption and organizational culture with and without the interaction term. The un-standardized coefficient was used while reporting coefficient for moderation as they represent simple effects rather than the main influences that are exposed in the additive regression model (Whisman and McClelland, 2005). Without the interaction term β results for Organizational Culture had a strong significant contribution to organizational performance (β=0.805, t(201)=5.138, p=0.000). In the second Model 2, both Organizational Culture and the interaction term had a significant contribution to the model with (β=0.348, p=0.000) for organizational culture and (β=0.565, p=0.000) for the interaction term respectively. The final model that consisted of the three variables revealed that Organizational Culture affected, (β=0.826, p=0.000). At the same time, the interaction term did not have a significant effect. Still, Organizational Culture moderated the relationship between Quality Management System Adoption and organizational performance, resulting in an impact of (β=0.593, p=0.030).When interaction terms were introduced for management system adoption, organizational culture (moderator) and the interaction term, the β coefficient are 0.492, 0.782, and 0.050, respectively. As a result, the hypothesized moderation model was confirmed to be;

$$\hat{Y} = -0.0400 + 0.492X + 0.782Z + 0.050XZ \quad (4)$$

In the model, the intercept and the XY slope were influenced by Z (the moderate variable) intercepts and slopes of line $\hat{Y}$ X. The un-standardized co-efficient of the moderator model b_3 is 0.05.This means that for each unit increase in Z, the slope relating Xto *Y* increases by 0.50 units. This further means that, as Quality management system adoption levels increases by one unit, the organizational performance levels increases by 0.05.

Hierarchical multiple regression models were used to carry out the moderation analysis using these three variables. In the first step, the organizational performance was regressed against organizational culture variables to control for it, simply by entering the organizational culture variable in the model at first. In the second step, the interaction term was entered in the model, and finally quality management system adoption.

The findings in Table 3 indicate the moderation results from the three models. In the first model, the moderator variable (organizational culture) indicated a strong positive

Table 1. Overview of quality management system adoption, organizational performance and interaction term.

Variable	N	Minimum	Maximum	Mean	Standard Deviation
Mean Organizational Performance	165	2.01	4.73	3.45	0.60
Mean Organizational Culture	165	1.73	4.60	3.49	0.63
interaction term	165	5.42	21.69	12.71	4.06
Valid N (listwise)	165				

Source: Research data (2017).

Table 2. Model coefficients the moderating effect of organization culture on the relationship between Quality Management System adoption and organization performance on public universities in Kenya.

Coefficient						
Model		Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. error	Beta		
1	(Constant)	0.800	0.156		5.138	0.000
	Mean Organizational Culture	0.761	0.044	0.805	17.310	0.000
2	(Constant)	1.241	0.139		8.915	0.000
	Mean Organizational Culture	0.330	0.062	0.348	5.312	0.000
	interaction term	0.084	0.010	0.565	8.608	0.000
3	(Constant)	-0.400	0.763		-0.524	0.601
	Mean Organizational Culture	0.782	0.216	0.826	3.623	0.000
	interaction term	0.050	0.062	-0.336	-0.806	0.421
	Mean Quality Management System Adoption	0.492	0.225	0.593	2.186	0.030

[a]Dependent Variable: Mean Organizational Performance.

correlation with corporate performance (R=0.805). The R square value indicated that Organizational Culture accounted for 64.8% change in the organizational performance, (R square =0.648) while the adjusted R square value after the shrinkage revealed a slightly lower value, 64.6% due to the actual population measure (Adjusted R square = 0.646). These results were significant, implying the overall model 1 was statistically significant, and the results were not by chance but strictly due to precise model fit (F(1, 201)=146.210, p=0.000).). In Model 2, the findings indicate that both moderator variable and interaction term accounted for 75.8% significant change in organizational performance (R square =0.758, p=0.000, F(1, 162)=74.099). Finally, in Model 3, Quality Management System Adoption accounted for a significant 0.7% change in organizational performance (R square change =0.007, p=0.030, F(1,161)=4.777). This implies that organizational culture moderated the relationship between Quality Management System Adoption and organizational performance positively.

They were anchored on structural contingency theory and the conceptual study framework, which highlights that organizations have failed with their quality initiatives and that one possible reason is lack of understanding of the role of Quality Management System on performance. An introduction of a moderator into a model between the independent and dependent variables would influence the effect of the relationship. To Iqbal et al. (2012), organization culture is that glue that combines the non-human resources to that of human resources in the organization to establish teamwork and excellent performance. From this study finding, Quality Management System adoption has a robust significant contribution to organizational performance. Moreover, on the introduction of organization culture, Quality Management System adoption was reduced to a unique negative contribution, which implies that a change in the organizational culture could lead to a reduction in the organizational performance.

These findings are inconsistent with the results of Wanyoike (2016), Iqbal et al. (2012) and Demirbag et al. (2006) that an introduction of a new variable leads to significantly sizeable positive moderation effect. Further, the findings are corroborated by Hussain and Younis (2015) who established that introduction of continuous improvement on leadership and performance leads to a partial moderation between organizational performance and construct of quality management practices. However, according to the studies of Sanders and Linderman

Table 3. Model summary on the moderating effect of organization culture on the relationship between Quality Management System adoption and organization performance on public universities in Kenya.

Model	R	R square	Adjusted R square	Std. error of the estimate	Change statistics				
					R Square change	F Change	df1	df2	Sig. F change
1	0.805[a]	0.648	0.646	0.35857	0.648	299.645	1	163	0.000
2	0.871[b]	0.758	0.755	0.29793	0.111	74.099	1	162	0.000
3	0.875[c]	0.765	0.761	0.29452	0.007	4.777	1	161	0.030

[a]Predictors: (Constant), Mean Organizational Culture. [b]Predictors: (Constant), Mean Organizational Culture, the interaction term. [c]Predictors: (Constant), Mean Organizational Culture, interaction term, Mean Quality Management System Adoption. Source: SPSS Data (2017).

(2014), and Demirbag et al. (2006), though there was a moderation effect on the introduction of a new variable, the moderation impact is partly due to external organization failure and other Quality Management System Variables.

The study findings contradict that of Roldán et al. (2017), whose study revealed the adverse effects of quality management on open innovation performance. However, this could be overcome by complementing the organization's learning style with that of its open innovation partner, particularly, its supply network, and, most importantly, obtaining information technologies compatible with those of its supply network members.

From the study findings, it is evident that organizational culture significantly and positively moderates the relationship between QMS adoption and organizational performance. On this basis H_3 which predicts that there are no significant moderating effects of organizational culture on QMS adoption and organizational performance on public universities in Kenya is rejected. The results of this objective imply that culture should be adhered to when introducing any new system to be able to identify any challenges and opportunities available for appropriate action.

Conclusion

The study sought to establish the moderating effects of organizational culture on Quality Management System adoption and organizational performance on public universities in Kenya. The null hypothesis (*Ho*) stated that there are no significant moderating effects of organizational culture on Quality Management System adoption and organizational performance on public universities in Kenya. This hypothesis was tested and actualized by use of Moderated Regression Analysis (MRA). It was based on the interaction between quality management system adoption and organizational culture using a hierarchical regression. The model includes quality management system adoption as the independent variable, organizational culture as the moderator and the interaction effect was significant. When compared with the reduced model, which only includes predictor variable and moderators, the addition of the interaction terms in the full model significantly increases the R^2. Therefore, in the final model, the overall percentage change in organizational performance is accounted for by quality management system adoption; the moderator term and the interaction term are more than the original R^2 value without the interaction term from 0.758 to 0.765 and was statistically significant. They were implying that organizational culture completely moderates the relationship between quality management system adoption and organizational performance rendering it meaningful.

The findings of this objective indicated that organizational culture had a moderating effect on this relationship. It, therefore, came out that even as the Quality Management System adoption improves the performance of the organizations, which are the public universities, organizational culture has a role to play. The introduction of organizational culture alters the Quality Management System adoption such that good values enhance better performance under the QMS. The finding provides evidence for invalidating the earlier stated null hypothesis that "there are no significant moderating effects of organizational culture on Quality Management System adoption and organizational performance on public universities in Kenya. Based on the above evidence, the study concludes that organizational culture increases the effect of Quality Management System adoption on organizational performance in public universities.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Earnings management techniques in the context of Italian unlisted firms

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The research expands the earnings management (EM) literature for Italian unlisted firms by investigating the drivers of both accrual-based (AEM) and real activity-based (REM) earnings management. According to prior literature, the reliability of financial statements of these firms concerns mainly lenders in assessing borrower creditworthiness, and Tax Offices in calculating corporate tax. We analyse unlisted firms as they represent 99.9% of Italian firms, consistent with most European countries. We estimate models using factors drawn from the literature which potentially influences both AEM and REM, along with some robustness tests. For AEM, ownership concentration is a positive driver, consistent with the entrenchment hypothesis, and firm leverage is a positive driver, suggesting the use of debt covenant violation avoidance strategies. Quality auditor engagement tends to constrain AEM, while size has a negative impact. However, tax drives AEM and profitability has a positive impact. For REM, ownership concentration has no impact, and leverage has a positive impact. The engagement of Big 4 constrains REM. Our expectations are confirmed when the total earnings management variable is used as the dependent.

Key words: Earnings management, accrual-based earnings management, real activity-based earnings management, determinants, unlisted firms, Italy.

INTRODUCTION

Leuz et al. (2003) find for a sample of listed firms from 31 countries that Italy ranks highly (fifth) in terms of engagement in earnings management activity. Analysing a sample of Italian unlisted firms, Poli (2013a, b; 2015), including the earnings distribution, finds that such firms smooth their earnings for the purposes of loan covenants and tax reduction. The findings are consistent with the wider existing literature (Ball and Shivakumar, 2005; Burgstahler et al., 2006). Studying the factors that drive earnings management (EM) initiatives may be helpful in

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understanding the complex phenomenon of earnings manipulation, and should aid the enforcement of domestic accounting standards and rules. Italy presents an interesting case as it is a civil law country where accounting and tax rules are strongly aligned (Lamb et al., 1998). Consistent with the extant literature (Ball and Shivakumar, 2005), Italian firms may have an incentive to engage in earnings manipulation to both avoid debt covenant violations and to minimize tax payments.

Roychowdhury (2006) notes that earnings management may be undertaken using two main techniques, accrual-based earnings management (AEM) or real activity-based earnings management (REM). Fields et al. (2001) point out that an earnings management environment may only be fully comprehended by evaluating the use of both AEM and REM since managers aiming to manipulate earnings may use both EM techniques concurrently. Since unlisted firms are not under the scrutiny of stakeholders (Ball and Shivakumar, 2005), they may have an incentive to use the two earnings management techniques simultaneously, reducing the reliability of their financial information. However, to our best knowledge, prior literature analysing unlisted firms (Ball and Shivakumar, 2005; Coppens and Peek, 2005; Poli, 2013a, b, 2015; Bisogno and De Luca, 2016), focuses on the use of AEM alone. Therefore, to address this shortcoming, the aim of this research is to analyze EM in unlisted firms by investigating which corporate governance or/and financial characteristics are incentives when using AEM, REM of both. The study investigates the drivers of both AEM and REM techniques in Italian unlisted firms, which represent about 99.9% of firms in Italy. By analyzing both AEM and REM earnings management techniques, this research extends the prior literature which focuses mainly on AEM alone (Coppens and Peek, 2005; Bisogno, 2012; Hope et al., 2012; Poli, 2013a, b, 2015; Bisogno and De Luca, 2016), while, to our best knowledge, it does not provide evidence for REM in these firms.

The study makes at least three key contributions to the EM literature. Firstly, it examines the determinants of AEM and REM initiatives in Italian unlisted firms, an area of the EM literature which is currently underdeveloped, since it analyzes the simultaneous use of both earnings management techniques. Secondly, given that the Italian economy is characterized by highly concentrated firms, which are both family and non-family orientated (Giacomelli and Trento, 2005; Cascino et al., 2010; Cesaroni and Ciambotti, 2011), we examine how ownership concentration influences EM behaviour and the propensity to use one or both earnings management techniques. Thirdly, this study relates the use of the two earnings management techniques to corporate governance and firm characteristics that may, according to the literature, drive earnings management initiatives. Finally, we also add some control variables drawn from the literature which may have an impact on EM initiatives.

We estimate OLS regression models for a sample of 9,414 Italian unlisted firms over the period 2011 to 2018 giving a total of 75,312 firm-year observations. To address the issue of heteroscedasticity, the variable coefficients are estimated using robust standard errors. In addition, these errors are clustered by firms and years (Petersen, 2009). Our findings indicate that leverage and financial distress drive both EM techniques, suggesting that leveraged firms rely on both earnings management techniques to meet lenders' expectations. Taxation and ownership concentration drive AEM alone. Finally, firm size and the engagement of Big 4 audit companies negatively drive both AEM and REM. The next section reviews the existing literature and presents our hypothesis development. The research methodology section discusses the research methods employed and the study data. The main findings of our empirical analysis are discussed in the results section, followed by a robustness test section. Finally, our conclusions and limitations of the study are discussed, and directions for future research are outlined.

MATERIALS AND METHODS

Literature and hypothesis development

With foundations in agency theory (Jensen and Meckling, 1976), the extant literature identifies a range of factors that influence firms' engagement in EM initiatives, and these factors vary across both firms and countries (Leuz et al., 2003). With regard to unlisted firms, the literature (Burgstahler et al., 2006; Poli, 2013a; 2013b; 2015) finds that firms engage in EM initiatives mainly for the purposes of meeting debt covenants or for tax reduction. These findings are confirmed by Poli (2015) who investigates the impact of concentrated, institutional and managerial ownership on EM initiatives in Italian unlisted firms over the years 2012-2013. Ball and Shivakumar (2005) find that earnings quality (manipulation of earnings) is higher (lower) in listed than in unlisted firms as the former are penalised with higher litigation costs when revealing low earnings quality. Further, Van Tendeloo and Vanstraelen (2008) argue that the financial statements of unlisted firms are not under such acute pressure from auditors and financial markets and therefore these firms may have a greater incentive to manage earnings in order to deal with influential stakeholders such as lenders and tax authorities better (Valentincic et al., 2017). Healy and Wahlen (1999) argue that the EM literature traditionally concentrated on accrual-based EM and the estimation of discretionary accruals. Drawing upon the advances of Schipper (1989), Fields et al. (2001) argue that EM is a complex phenomenon that is only partly investigated by examining accrual-based earnings management. Indeed, earnings may also be managed by adjusting the real operations of the firm, that is, real activity-based earnings management. Further, EM is difficult to detect as accrual-based and real activity-based EM may be employed as substitutes rather than complements (Zang, 2012).

The literature analysing the use of REM initiatives is focused largely on firms undergoing an IPO as such firms may have an incentive to boost their performance to make them more attractive to investors. Analysing UK IPOs over the period 1998-2008, Alhadab et al. (2016) provide empirical evidence that firms engage in both EM techniques in advance of the IPO, confirming their use as complements. Al-Amri et al. (2017) study unlisted firms from Gulf

Cooperation Council countries and find that they engage more in REM than listed firms. Drawing on the extant literature, we next investigate the factors driving both AEM and REM strategies in unlisted firms.

Ownership concentration

The literature suggests that there are two mechanisms by which ownership concentration can affect earnings management: the alignment effect and the entrenchment effect. The alignment effect, which draws on the efficient monitoring hypothesis, suggests that as they share only a small proportion of the benefit of ownership, small shareholders do not have an incentive to monitor firm managers (Shleifer and Vishny, 1997; Swai and Mbogela, 2016). In contrast, large and controlling shareholders have a strong incentive to monitor firm management to preserve their significant investment in the firm, an effect supported by empirical evidence (Chen et al., 2010). Analysing a sample of East African listed firms, Swai and Mbogela (2016) provide empirical evidence of no relationship between ownership concentration and AEM, while they find ownership concentration impacts negatively on REM. Grimaldi and Muserra (2017) analyze Italian listed firms for the years 2010-2013, and find a negative relationship between AEM and ownership concentration, suggesting an alignment effect in concentrated ownership companies. The alignment effect may be explained in an Italian setting as firm ownership tends to be very stable, with owners changing little over time. Such owners have less incentive to manage earnings given their longer-term interest in the firm, particularly as they are often involved in its management (Poli, 2013a).

In contrast, the entrenchment effect suggests that controlling or majority owners have an incentive to use their position to damage the interests of non-controlling shareholders. Thus, following this line of argument we might expect ownership concentration and the extent of earnings management to be positively related (Shleifer and Vishny, 1997; Jaggi and Tsui, 2007) as the majority and controlling shareholders attempt to mask firm performance while destroying firm value for minority shareholders. Alternatively, Ding et al. (2007) find a U-shape relationship between EM initiatives and ownership concentration in Chinese listed firms, suggesting that the relationship is both nonlinear and may vary across countries.

Poli (2013a, b) finds empirical evidence that Italian unlisted firms tend to have highly concentrated ownership structures compared to listed firms, resulting in a high degree of managerial ownership and weak agency problems (Ball and Shivakumar, 2005). This dynamic may reduce the imperative for high-quality financial reporting for monitoring purposes (Fama and Jensen, 1983), while increasing it for debt covenant and tax reduction purposes. However, Poli (2015) provides empirical evidence that there is not a relationship between ownership concentration and earnings smoothing for Italian unlisted firms over the period 2012-2013. Taking into account the ownership characteristics and agency issues of Italian unlisted firms, we argue that they may have an incentive to mask their real performance through EM. Thus, we state the following hypothesis:

H1a: Ownership concentration is positively related to accruals-based earnings management in Italian unlisted firms.

There is a scarce literature investigating the relationship between ownership concentration and REM in relation to unlisted firms, perhaps due to the absence of available data. Swai and Mbogela (2016), analysing a sample of East African listed firms over the period 2010-2013, provide empirical evidence of a negative relationship between the two variables, consistent with an alignment effect. Francis et al. (2016) investigate the relationship between insider and outsider ownership concentration and real activity-based earnings management in a large international study of listed firms with different legal systems. They find that insider ownership is negatively related to REM, and that the relationship depends on the strength of a country's legal system and its ability to tackle the earnings management initiatives of firms. Moreover, the authors argue that insider (concentrated) owners that own a large proportion of the firm's capital are less likely to engage in REM as they destroy future firm value.

In Italian unlisted firms, ownership is considered stable (Poli, 2013a) as the owners are often involved in the management of the company (Ball and Shivakumar, 2005). Taking into account the corporate governance characteristics of Italian unlisted firms and the agency conflicts to which they are subject, and consistent with the prior literature suggesting that REM may cause a transfer of wealth from shareholders to other stakeholders (Garrod et al., 2007), we state the following hypothesis:

H1b: Ownership concentration is negatively related to REM in Italian unlisted firms.

Firms' leverage

Agency theory suggests that leverage may impact on earnings management in order for firms to avoid debt covenant violations (Watts and Zimmerman, 1986). Prior literature (DeFond and Jiambalvo, 1994; Dichev and Skinner, 2002; Beatty and Weber, 2003; Lazzem and Jilani, 2018) finds that leverage impacts positively AEM, suggesting that contracting motives, such as debt covenants, may be an incentive for managing earnings.

However, few studies investigate the impact of leverage on EM in unlisted firms. Moreira (2006), analysing a sample of Portuguese unlisted firms, finds that higher leverage firms have a greater probability of engaging in AEM to avoid debt covenant violations, consistent with the entrenchment effect. Poli (2015) provides empirical evidence of a positive relationship between AEM and bank loans in Italian unlisted firms. However, some studies find a negative relationship between leverage and EM as indebted firms are under greater scrutiny from lenders (Yang et al., 2008), and suggesting that leverage mitigates EM initiatives (Jensen, 1986). As bank loans are the main source of capital in unlisted firms (Ball and Shivakumar, 2005; Mafrolla and D'Amico, 2017) and lenders are likely to assess the borrower's creditworthiness by also analysing their financial information, leveraged firms are likely to improve firms' financial performances by engaging in earnings management initiatives. As a consequence, we propose the following hypothesis:

H2a: Leverage is positively related to AEM in Italian unlisted firms.

Graham et al. (2005) argue that listed firms prefer to manage earnings through REM rather than through AEM, as the former are less easily detected than the latter by auditors, financial markets and regulators. Hoang and Phung (2019) find a positive relationship between REM and leverage in a sample of Vietnamese listed firms. They explain that REM is harder to detect than AEM and therefore managers of indebted firms, under the scrutiny of lenders, receive net benefits when also engaging in REM. Based on the theory and arguments stated above, we state the following hypothesis:

H2b: Leverage is positively related to REM in Italian unlisted firms.

Auditor quality

The literature provides empirical evidence that Big N audited firms are likely to exhibit a lower level of discretionary accruals than firms audited by non-Big N auditors (DeAngelo, 1981; Krishnan, 2003; Zhou and Elder, 2004; Francis et al., 2013; Alzoubi, 2016). The literature concerning the relationship between auditor choice and

EM in unlisted firms suggests that larger auditors are of higher quality compared to other auditors due to their professional skills and competence, as well as their desire to maintain a good reputation (Mariani et al., 2010). Vander and Willekens (2004), analysing a sample firm of Belgian unlisted firms for the years 1994-1996, find that Big N audited firms are likely to exhibit a lower level of earnings management than smaller audited firms. Tendeloo and Vanstraelen (2008) investigate unlisted firms from Europe, and find that Big 4 auditors can limit earnings management practices more than other auditors due to their specialisation and skills. Mariani et al. (2010) examine Italian unlisted firms over the years 2004-2005, and include statutory auditors in the category of smaller auditors, that is, the typical independent audit body within the traditional corporate governance model of listed and unlisted firms. They find that large auditors are of higher quality compared to the statutory committee engaged as financial auditor.

In contrast, Bisogno (2012) studies Italian unlisted manufacturing firms, and finds no difference in the quality of audit performed across different auditor types. However, his results suffer from limitations as the research focuses only on industrial firms. We argue that larger auditors have an incentive to provide the same level of audit quality for unlisted firms as they do for listed firms, otherwise they may suffer some reputation loss. Within the traditional model of corporate governance, the Board of Statutory Auditors (the committee of statutory auditors) is an independent and professional body which has an important administrative auditing role. As a result, firm internal control systems are continuously checked by this committee whose role, work and responsibilities are regulated by Italian law (Mariani et al., 2010). Therefore, it is argued that financial information should be of high quality as the statutory committee checks for errors in preparing the financial statements and confirms their findings in a judgment report which must be approved at the shareholders meeting. Based on the extant literature and the discussion above, we posit the following hypothesis:

H3a: The engagement of a Big 4 auditor has the effect of reducing AEM in Italian unlisted firms.

Previous literature (Graham et al., 2005; Cohen and Zarowin, 2010) argues that because of their complexity, REM initiatives are more difficult for auditors and other stakeholders to detect. As REM strategies may be difficult to differentiate from the ordinary business operations of a firm, earnings management may be concealed. Indeed, there is empirical evidence that auditors are likely to detect AEM than REM (Cohen and Zarowin, 2010). Cohen and Zarowin study a sample of US-listed firms for the period 1987-2006 and find that larger auditors, while mitigating AEM, do not mitigate REM. The scholars explain this by assuming that REM "typically falls outside of the auditor's responsibility" (Cohen and Zarowin, 2010: 13).

With regard to Italian firms, the statutory committee is less likely to discover a manipulation of real activities, as this body does not question the management of the firm as such, except in the case of firm value destruction. In addition, Chi et al. (2011) provide evidence that Big 4 auditors do not constrain REM in listed firms. Loy (2013) finds empirical evidence that Big 4 auditors do not constrain REM in unlisted firms. These findings suggest that auditors (including Big 4 audit companies) do not constrain real activity-based management since they are concerned more with controls and financial statements rather than with day-by-day operations. Consistent with the prior literature, we expect a positive relationship between the engagement of a large (Big 4) auditor and REM, and propose our hypothesis as follows:

H3b: The engagement of a Big 4 auditor does not constrain REM in Italian unlisted firms.

Firms' size

According to the size hypothesis (Watt and Zimmermann, 1986), managers of larger firms are more likely to underestimate their earnings through their accounting choices (Amertha et al., 2014), thereby engaging in AEM techniques. This finding indicates that larger firms face higher political costs. Analysing a sample of listed firms over the period 1983-2000, Kim et al. (2003) find that small firms manage their earnings to a lesser extent than large firms. Further, Swastika (2013) finds a negative relationship between AEM and firm size in a sample of Indonesian listed firms for the years 2005-2007. These findings may be explained by the well-structured and organized internal control systems of large firms reducing AEM. Based on the extant literature, we posit the following hypothesis for AEM:

H4a: Firms' size negatively affects AEM in Italian unlisted firms.

Swai and Mbogela (2016) find that firms' size influences neither AEM nor REM initiatives in East African firms in the years 2004-2013. However, Vakilifard and Mortazavi (2016) provide empirical evidence that firm size impacts positively on REM in Japanese listed firms over the period 2004-2013, indicating that larger firms are likely to engage in REM. Thus, the literature on the relation between firm size and real activity-based earnings management is somewhat mixed. However, taking into account the fact that REM is more complex to arrange than AEM (Cohen and Zarowin, 2010), unlisted firms may find it simpler to engage in AEM than REM. We therefore develop the following hypothesis for the REM technique:

H4b: Firms' size negatively affects REM in Italian unlisted firms.

Taxation

Taxation is one of the determinants of EM initiatives in unlisted firms. Ball and Shivakumar (2005) and Van Tendeloo and Vanstraelen (2008) argue that engagement in earnings management initiatives for tax purposes depends on the relationship between financial and tax rules. Financial information is used mainly for contractual incentives and less for tax purposes in countries where financial and tax accounting are either not aligned or the relationship is weak (Desai and Dharmapala, 2009). However, in countries such as Italy, accounting and tax rules are strongly aligned, and thus tax income is estimated starting from the pre-tax income shown in the income statement (Poli, 2013a).

Coppens and Peek (2005) provide empirical evidence that unlisted firms often select accounting policies that decrease their reported earnings to minimize their tax payments, suggesting that unlisted firms are likely to reduce tax burdens by manipulating accruals. Burgstahler et al. (2006) analyse a sample of European listed and unlisted firms for the years 1999-2003, and provide empirical evidence that taxation impacts positively on EM in countries with a strong relationship between financial and tax accounting, that is, where financial and tax rules are related. Marques et al. (2011) find that Portuguese unlisted firms have a strong incentive to minimize their income tax burden by manipulating earnings around zero, while Poli (2013b) finds that Italian unlisted firms engage in AEM to reduce their tax payments. However, Karjalainen (2015) finds no evidence of earnings management for tax purposes in Finnish unlisted firms. Based on findings in the previous literature, we posit the following hypothesis:

H5a: The tax burden is positively related to AEM in Italian unlisted firms.

The decision of a firm to use one of the two earnings management

Table 1. Sample selection (sample years 2011-2018).

Sector	NACE 2-digit	Industry (description)	Frequency	%	Number of firms
1	01-09	Agriculture, mining and quarrying	424	0.56	53
2	10-33	Manufacturing activities	38,912	51.67	4,864
3	35-39	Electrical, gas, water supply activities	2,760	3.66	345
4	41-43	Building and construction activities	3,264	4.33	408
5	45-56	Wholesale, retail trade, transportation, accommodation activities	21,656	28.76	2,707
6	58-63	Information and communication activities	2,352	3.12	294
7	68-99	Professional, scientific, administrative, healthcare, public administration, education, and entertainment activities	5,944	7.89	743
		Total	**75,312**	**100**	9,414

techniques depends on their relative costs (Zang, 2012). Zang argues that REM influences tax payments as a consequence of the manipulation of real operations, an example being overproduction in a given year that increases inventories in that year. Garrod et al. (2007) find that concentrated unlisted firms are less likely to engage in REM for tax purposes since REM transfers wealth from owners/managers to stakeholders (the tax authorities). We then posit the following hypothesis:

H5b: The tax burden is negatively related to REM in Italian unlisted firms.

Control variables

Consistent with previous literature on EM, we introduce some control variables in our empirical models. Firstly, we control for firms' profitability. The literature (Van Tendeloo and Vanstraelen, 2008; Van and Chatterjee, 2015) provides empirical evidence that firms' profitability negatively drives AEM. Based on the evidence above, a negative relationship between ROA and AEM is expected.

The literature also suggests a relationship between REM and firms' profitability. REM alters the behaviour of firms and not just their accounting records and therefore it may have an impact on the future profitability of the firm, potentially destroying future firms' value (Roychowdhury, 2006; Zang, 2012). Thus, a negative relationship between ROA and REM is expected. We also add some other control variables impacting on the earnings management behaviour. We control for firms' age, because firms with a long history are expected to be exposed to more reputational risk (Ahmad et al., 2014) in which case earnings management initiatives could be detected by stakeholders. Gul et al. (2009) find a negative empirical association between firms' age and the use of earnings management techniques (both AEM and REM). Therefore, a negative relationship between the control variable firms' age and both earnings management techniques (AEM and REM) is expected. We also control for financial difficulties, proxied by the Altman Z-Score (Altman and Hotchkiss, 2006) for unlisted firms. A categorical indicator assuming three values was used: the value 0 for firms in health zone, the value 1 for firms in the grey zone, and the value 2 for distressed firms. Firms showing a high value of the Z-Score (that is a Z-score equals 2) have a lower probability to fail than firms showing a low value of the score. While financial difficulties may attract the scrutiny of lenders, Mafrolla and D'Amico (2017) note that they are the main sources of finance in unlisted firms. Therefore, firms with financial problems are more likely to engage in EM than other firms in order to improve their creditworthiness. Therefore, according to the debt hypothesis (Watts and Zimmerman, 1986), a positive association between the dependent variables AEM and REM and the control variable Z-Score indicator is expected. Agrawal and Chatterjee (2015) analyze a sample of Indian firms for the years 2009-2014 and find that financial problems (proxied by the Z-Score) impact positively EM. Finally, we control for the fixed assets ratio (Chen et al., 2018) since it may be an incentive to engage in earnings management initiatives. According to Chen et al. (2010), a positive relationship between the fixed assets ratio and AEM is expected, while a negative relationship between the fixed assets ratio and REM is expected because the amortization and depreciation only impacts accruals at the end of the year when the financial statements are prepared.

Sample selection

Data were collected from the Bureau van Dijk AIDA Database for the years 2011 to 2018. The data sample consists of Italian unlisted firms. These firms are not obliged to prepare consolidated financial statements, have equity capital exceeding the audit requirement threshold of €120,000. Finance firms were excluded given the non-standard format of their financial statements and regulatory status. Further, we remove firms with missing data in one or more years, and any firms that failed during the period of the analysis. Finally, we remove data outliers and missing values, arriving at a balanced panel of 9,414 firms, giving a total of 75,312 firm-year observations. A description of our balanced sample firms is given in Table 1.

Measurement of the AEM dependent variable

According to previous literature, signed discretionary accruals are used as we are interested in measuring the direction of the accruals, that is, whether earnings are over- or under estimated. The literature proposes several models for decomposing total accruals into both discretionary and non-discretionary accruals components (Jones, 1991); the Dechow et al. (1995) model (also named the modified Jones model), the Kasznik (1999) model, and the Kothari et al. (2005) model. In this paper, we used Mariani et al. (2010) and Bisogno (2012) models:

$$TA_t = (\Delta Current\ Assets_t - \Delta Cash_t) - (\Delta Current\ Liabilities_t) - Depreciation\ and\ Amortization \quad (1)$$

The difference between total accruals and normal total accruals is the abnormal accruals (DeAngelo, 1981). Then, we can estimate discretionary and non-discretionary accruals changes from the total accrual changes from the previous year as follows:

$$\Delta TA_t = (TA_t - TA_{t-1}) = (DA_t - DA_{t-1}) + (NA_t - NA_{t-1}) \quad (2)$$

The total accruals are estimated (in Equation 3) by applying the modified Jones model (Dechow et al., 1995) as follows:

$$\frac{TA_t}{A_{t-1}} = \frac{\alpha}{A_{t-1}} + \frac{\beta_1(\Delta REV_t - \Delta REC_t)}{A_{t-1}} + \frac{\beta_2(PPE_t)}{A_{t-1}} + \epsilon_t \quad (3)$$

Where: $TA_{i,t}$ = total accruals for firm *i* in year *t*; $\Delta REV_{i,t}$ = net sales for firm *i* in year *t* less revenues in year *t–1*; ΔREC_t = accounts receivable for firm *i* in year *t* less receivables in year *t–1*; $PPE_{i,t}$ = the sum net property, plant and equipment and long-term deferred expenses for firm *i* in year *t*; $A_{i,t-1}$ = total assets in year *t–1*; and ϵ_t = the model error term.

Consistent with Dechow et al. (1995) and Mariani et al. (2010), we estimate discretionary accruals as the difference between total and expected accruals (that is, the error term in Equation 3):

$$DACC_{i,t} = \frac{TA_{i,t}}{A_{i,t-1}} - \left(\frac{\alpha}{Ai_{,t-1}} + \frac{\beta_1(\Delta REV_{i,t} - \Delta REC_{i,t})}{A_{i,t-1}} + \frac{\beta_2(PPE_{i,t})}{A_{i,t-1}} + \epsilon_t\right) \quad (4)$$

Measurement of the REM dependent variable

Roychowdhury (2006) estimates REM by using three metrics, as follows: (i) the expected value of the operating cash flows; (ii) expected production costs; and (iii) expected discretionary expenditures. In this paper, we estimate REM in relation to abnormal cash flows from operations and abnormal production costs. Since neither the net income statement format provided by the Italian civil code nor the notes to the accounts disclose the discretionary expenses such as R&D, we do not estimate discretionary expenses.

Abnormal cash flows from operations (CFO) are estimated by deducting actual cash flows from operations from the normal level of CFO, as in Subramanyam (1996). Equation 5 estimates the abnormal CFO.

$$\frac{CFO_{i,t}}{A_{t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{t-1}}\right) + \beta_1\left(\frac{S_{i,t}}{A_{t-1}}\right) + \beta_2\left(\frac{\Delta S_{i,t-1}}{A_{t-1}}\right) + \epsilon_t \quad (5)$$

Where: $CFO_{i,t}$ = the abnormal level of cash flows from operations for firm *i* in year *t* and the change in inventory from *t-1* to *t*; A_{t-1} = total assets for firm *i* in year *t-1*; $S_{i,t}$ = net sales in year *t*; $\Delta S_{i,t}$ = the change in net sales from year *t-1* to *t*; and ε = the model error term.

To estimate the normal level of production costs, in Equation 8 we combine the cost of goods sold (Equation 6) and the normal level of inventory (Equation 7) related to the normal cost of goods sold (Omid, 2015; Elkalla, 2017).

$$\frac{COGS_{i,t}}{A_{t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{t-1}}\right) + \beta_1\left(\frac{S_{i,t}}{A_{t-1}}\right) + \epsilon_t \quad (6)$$

$$\frac{\Delta INV_{i,t}}{A_{t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{t-1}}\right) + \beta_1\left(\frac{S_{i,t}}{A_{t-1}}\right) + \beta_2\left(\frac{\Delta S_{i,t-1}}{A_{t-1}}\right) + \epsilon_t \quad (7)$$

$$\frac{PROD_{i,t}}{A_{t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{t-1}}\right) + \beta_1\left(\frac{S_{i,t}}{A_{t-1}}\right) + \beta_2\left(\frac{\Delta S_{i,t}}{A_{t-1}}\right) + \beta_3\left(\frac{\Delta S_{i,t-1}}{A_{t-1}}\right) + \epsilon_t \quad (8)$$

Where: $PROD_{i,t}$ = the abnormal level of production costs. This variable is proxied by the sum of cost of goods sold for firm *i* in year *t* and the change in inventory from *t-1* to *t*; A_{t-1} = that is total assets for firm *i* in year *t-1*; $S_{i,t}$ = that is net sales in year *t*; $\Delta S_{i,t}$ = that is the change in net sales from year *t-1* to *t*; and ε = the model error term.

The empirical model

To examine the factors driving both AEM and REM, the linear regression models given in Equations 9 and 10 are estimated. To capture unobserved heterogeneity across and time, we estimate coefficients of both Equations 9 and 10 using robust standard errors clustered by firms and years (Petersen, 2009). Each model also controls for industry sector.

$$AEM_{i,t} = \alpha_i + \beta_1 OWN_{i,t} + \beta_2 LEV_{i,t} + \beta_3 BIG4_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 TAX_{i,t} + \beta_6 ROA_{i,t} + \beta_7 AGE_{i,t} + \beta_8 ZSCORE_{i,t} + \beta_9 TANG_{i,t} + \varepsilon_{i,t} \quad (9)$$

(4)

$$REM_{i,t} = \alpha_i + \beta_1 OWN_{i,t} + \beta_2 LEV_{i,t} + \beta_3 BIG4_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 TAX_{i,t} + \beta_6 ROA_{i,t} + \beta_7 AGE_{i,t} + \beta_8 ZSCORE_{i,t} + \beta_9 TANG_{i,t} + \varepsilon_{i,t} \quad (10)$$

Where: $AEM_{i,t}$ = the signed abnormal discretionary accruals, computed according to the modified Jones model; $REM_{i,t}$ = real activity-based earnings management proxied by signed abnormal production costs; $OWN_{i,t}$ = ownership concentration, proxied by a dummy variable taking the value 0 for control of less than 25%, and 1 for control which is greater than or equal to 25% of equity; $LEV_{i,t}$ = financial leverage, measured as the ratio of debt to banks and other financial providers to total assets; $SIZE_{i,t}$ = the natural logarithm of total assets; $BIG4_{i,t}$ = a dummy variable taking the value of 1 if a Big 4 company audits a firm; $TAX_{i,t}$ = taxation burden (the sum of tax payables and deferred taxes, scaled by income before taxes); $ROA_{i,t}$ = the return on assets ratio; $AGE_{i,t}$ = is the age of the firm i estimated from the incorporation date; $ZSCORE_{i,t}$ = a categorical variable proxying the Altman's Z-Score for unlisted firms. The higher the value of the variable ZSCORE, the higher the financial problems of the firm *i* in the year *t*; $TANG_{i,t}$ = a continuous variable proxying for the proportion of net fixed tangible assets recognised by firm *i* in the year *t*, scaled by the total assets of the same year; and $\varepsilon_{i,t}$ = the model error term. Table 2 details dependent, independent, and control variables, along with a summary of the expected coefficient signs.

RESULTS AND DISCUSSION

Descriptive statistics

Descriptive statistics for both the dependent variables and for the continuous independent variables are

Table 2. Measurement of the model variables.

Dependent variable	Variable description		
$AEM_{i,t}$	Abnormal accrual earnings management proxied by the absolute value of abnormal discretionary accruals according to the modified Jones model (Jones, 1991; Dechow et al., 1995)		
$REM_{i,t}$	The abnormal level of production costs measured as the estimated residual from Roychowdhury (2006) approach		
Test variables	**Variable description**	**Hypothesis**	**Expected sign**
$OWN_{i,t}$	Ownership concentration is a dummy variable taking the value 0 if shareholders control less than the 25% of the equity, and the value 1 if the majority shareholder owns at least 25.01% of the equity.	H1a H1b	+ -
$LEV_{i,t}$	Leverage is measured as the debt to banks and other financial providers at year t divided by total assets at year t.	H2a H2b	+ +
$BIG4_{i,t}$	Auditor type dummy variable, taking the value 1 if a Big 4 audit company audits a company, and 0 otherwise. Big 4 audit companies for this purpose are PwC, Ernst and Young, KPMG, and Deloitte.	H3a H3b	- +
$SIZE_{i,t}$	Firm size for year t, proxied by the natural logarithm of total assets for year t.	H4a H4b	- -
$TAX_{i,t}$	Tax expense, proxied by tax payables in year t, scaled by income before taxes in year t.	H5a H5b	+ -
Control variables	**Variable description**		**Expected sign**
$ROA_{i,t}$	The Return on Assets ratio, proxying firm profitability.	$AEM_{i,t}$ $REM_{i,t}$	- -
$AGE_{i,t}$	Firm age, proxied by the natural logarithm of the year from the incorporation date and the year of the analysis.	$AEM_{i,t}$ $REM_{i,t}$	- -
$ZSCORE_{i,t}$	Altman's Z-Score, proxied by a categorical variable taking the value 0 for firms showing a Z-score above 2.9 (healthy zone), the value 1 for firms showing a Z-score between 1.23 and 2.9 (grey zone), and the value 2 for firms showing a Z-score lower than the threshold 1.23 (distressed zone). The Z-score is estimated as follow: $Z' = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5$	$AEM_{i,t}$ $REM_{i,t}$	+ +
$TANG_{i,t}$	Fixed assets ratio, proxied by the tangible fixed assets in year t scaled by the total assets in year t.	$AEM_{i,t}$ $REM_{i,t}$	+ -

presented in Table 3. Our sample firms show that the signed value of AEM has a mean of -0.002, while the signed value of REM has a mean of -0.017 and a maximum of 5.370. Mean financial leverage is 0.210 with a standard deviation of 0.177. The mean tax burden, measured as the ratio of total taxes to earnings before taxes, has a value of 0.241 with a standard deviation of 15.712. The recognition of both payable and deferred taxes across the years can have a negative or a positive balance according to the resorption of the temporary differences (for deferred taxes). The average profitability (ROA) of the sample firms is 2.6%, while the firm size is, on average, 10.115 (proxied by the natural logarithm of total assets).

Table 4 exhibits descriptive statistics for the dichotomous dummy independent variables. We observe that 53.8% of the sample firms have an ownership concentration greater than 25%, and thus Italian unlisted firms are in general highly concentrated (Cascino et al., 2010). With regard to the auditing of financial statements, 21.3% of our sample firms engage a Big 4 audit company, while 78.7% of them engage a non-Big 4 audit company or a Board of Statutory Auditors. Untabulated results show that for firms audited by smaller auditors, 52.25% are audited by a BSA, whereby it is engaged as both administrative and financial auditor. Finally, Table 4 exhibits that the 95.8% of the sample firms (72,147 firm-year observations) are in the distress zone (the Z-score takes the value of 2), the 3.60% in the grey zone (the Z-Score takes the value 1), while the 0.60% of the sample

Table 3. Descriptive statistics for the continuous variables (N= 9,414 for 75,312 obs.)

Variable	Mean	Median	Std. Dev.	Minimum	Maximum	25th perc.	75th perc.
AEM	-0.002	0.000	0.112	-3.070	4.080	-0.040	0.040
REM	-0.017	-0.010	0.178	-3.550	5.370	-0.080	0.050
OWN	0.538	1.000	0.499	0	1	0.000	1.000
LEV	0.210	0.190	0.177	-0.010	3.330	0.040	0.340
BIG4	0.213	0.000	0.410	0	1	0.000	0.000
SIZE	10.115	9.960	1.077	4.530	17.000	9.380	10.700
TAX	0.241	0.350	15.712	-2,700.000	574.010	0.260	0.510
ROA	0.026	0.020	0.080	-2.360	7.180	0.000	0.050
AGE	32.748	31.000	16.784	3.000	153.000	20.000	41.000
TANG	0.232	0.180	0.210	0	1	0.060	0.350

Note: This table reports the descriptive statistics for the dependent and the independent variables in Equations 9 and 10. Variable measurement and details are provided in Table 2.

Table 4. Descriptive statistics for the model dummy and categorical variables (N= 9,414 for 75,312 obs.).

Variable	Panel A) Dummy variables			
	0		1	
	N.	%	N.	%
OWN	34,808	46.2%	40,504	53.8%
BIG4	59,240	78.7%	16,072	21.3%

	Panel B) Categorical variable					
	0		1		2	
	N.	%	N.	%	N.	%
ZSCORE	485	0.6%	2,680	3.6%	72,147	95.8%

This table reports the descriptive statistics for the dummy and categorical variables in Equations 9 and 10. Variable measurement and details are provided in Table 2.

firms (the Z-Score takes the value of 0) is the healthy zone.

Correlation matrix

Table 5 gives the Pearson/Spearman correlation matrix for our model variables. Since the correlation coefficients are fairly small in magnitude, we argue that multicollinearity is not a significant problem in our sample firms. Further, the VIFs for our model variables are lower than 2. The correlation between the dependent variables, AEM and REM, is negative (Pearson and Spearman coefficient) and significant at the 1% level (-0.107), demonstrating that these variables do not move in the same direction and that there is substitution between the two earnings management strategies.

It is observed that *AEM* exhibits a positive relationship with *OWN*, while it exhibits a negative relationship with *LEV*, *BIG4*, *SIZE*. Therefore, AEM technique is greater in firms with greater ownership concentration, and lower in firms with greater leverage, size and in firms engaging Big 4 auditors. In common with *AEM*, *REM* exhibits a positive relationship with *OWN* and LEV, while it exhibits a negative relationship with *BIG4*, *SIZE*. Thus, REM is higher in firms with greater ownership concentration and greater leverage, and lower in firms with greater size and in firms engaging Big 4 auditors. The variable *TAX* exhibits an insignificant correlation with the dependent variables, probably because the tax is determined by variables exogenous to our model. *ROA* exhibits a positive and significant relationship with *AEM,* while it exhibits a negative correlation with *REM*. These results imply that the lower firm performance may increase the likelihood of engaging in REM activities to signal future firm value.

Table 6 exhibits the results of the OLS regression models of the potential drivers of the two earnings management techniques (AEM and REM). Model 1 employs the signed AEM as the dependent variable, while Model 2 employs the signed REM as the dependent. The coefficients in Models 1 and 2 are estimated according to Petersen (2009), by using robust standard errors clustered by firm and year to check for data endogeneity. VIF values are lower than 2 for all variables in Models 1 and 2, and both models also control

Table 5. Correlation matrix for the model variables (N= 9,414 for 75,312 obs.).

	AEM	REM	OWN	LEV	BIG4	SIZE	TAX	ROA	AGE	ZSCORE	TANG
AEM	—	-0.077***	0.021***	-0.043***	-0.074***	-0.031***	0.020***	0.152***	0.024***	0.063***	0.055***
REM	-0.107***	—	0.028***	0.216***	-0.073***	-0.112***	0.045***	-0.686***	-0.013***	-0.144***	-0.039***
OWN	0.017***	0.012***	—	0.096***	-0.170***	-0.123***	0.040***	0.000	0.021***	0.050***	-0.042***
LEV	-0.038***	0.172***	0.086***	—	-0.087***	0.059***	0.128***	-0.325***	-0.044***	-0.275***	0.166***
BIG4	-0.053***	-0.048***	-0.170***	-0.075***	—	0.346***	-0.096***	0.062***	-0.082***	-0.079***	-0.062***
SIZE	-0.026***	-0.058***	-0.132***	0.040***	0.393***	—	-0.133***	0.017***	0.074***	-0.199***	0.107***
TAX	-0.004	-0.002	-0.007*	0.008*	-0.012**	-0.016***	—	-0.138***	-0.071***	-0.036***	-0.004
ROA	0.243***	-0.624***	0.006	-0.242***	0.027***	0.005	0.004	—	0.004	0.367***	-0.147***
AGE	0.016***	-0.015***	-0.001	-0.059***	-0.051***	0.078***	-0.006	-0.004	—	-0.002	0.153***
ZSCORE	0.080***	-0.165***	0.054***	-0.253***	-0.079***	-0.214***	0.010**	0.309***	-0.004	—	-0.613***
TANG	0.041***	-0.020***	-0.068***	0.136***	-0.040***	0.103***	-0.011**	-0.099***	0.104***	-0.639***	—

Note: Pearson and Spearman correlations for the model variables are provided below and above the diagonal, respectively. *** Correlation is significant at the 1% level (2-tailed), ** at the 5% level (2-tailed) and * at the 10% level. Variable measurement and details are provided in Table 2.

Table 6. Linear panel regression model for AEM and REM (with robust standard errors, Petersen, 2009).

Variable	Model 1: AEM Firms= 9,414 Obs: 75,312				Model 2: REM Firms= 9,414 Obs: 75,312			
	Exp. sign	Coeff.	p-value		Exp. sign	Coeff.	p-value	
Constant		-0.028	0.002	***		0.093	0.000	***
OWN	+	0.002	0.025	**	-	-0.000	0.801	
LEV	+	0.007	0.059	*	+	0.304	0.059	*
BIG4	-	-0.013	0.000	***	+	-0.007	0.000	***
SIZE	-	-0.001	0.013	**	-	-0.006	0.000	***
TAX	+	0.002	0.050	**	-	0.001	0.296	
ROA	-	0.351	0.000	***	-	-1.389	0.000	***
AGE	-	0.002	0.041	**	-	-0.002	0.056	*
ZSCORE	+	0.007	0.014	***	+	0.011	0.058	*
TANG	+	0.037	0.000	***	-	-0.066	0.000	***
	Model specification:				Model specification:			
	R-square: 6.78%				R-square: 40.09%			
	F (15,75,311) = 50.71				F (15,75,311) = 160.42			
	Prob> F= 0.000				Prob> F= 0.000			
	VIF < 2%				VIF < 2%			
	Industry control: yes				Industry control: yes			

This table reports the linear panel regression for Equations 9 (Model 1) and 10 (Model 2). *** = significant at the 1% level (2-tailed); ** = significant at 5% level (2-tailed), and * = significant at the 10% level (2-tailed). Standard errors are robust (Petersen, 2009), clustered by both firm and year. Variable measurement and details are provided in Table 2.

for industry sector. Model 1, testing Equation 9, exhibits an R-square of 6.78%, while the F test is significant at the 1% level.

The coefficient of the independent variable OWN exhibits a positive sign, as expected, and is significant at the 5% level, indicating that more concentrated ownership in unlisted firms leads to greater AEM. This is consistent with Shleifer and Vishny (1997) and Jaggi and Tsui (2007). The positive relationship, consistent with the entrenchment effect, suggests that dominant shareholders (with greater than 25.01% of the firm's equity) have greater incentives to damage the interests of the minority shareholders, masking firm performance by manipulating earnings. This finding is consistent with the entrenchment hypothesis. Therefore, H1a is supported.

The coefficient of the independent variable *LEV* exhibits a positive sign, as expected, which is significant at the 10% level. This finding indicates that unlisted firms,

according to prior literature (Mafrolla and D'Amico, 2017), are more likely to engage in AEM as their financial leverage increases in order to avoid potential violation of debt covenants, or to mask their weak financial performance to lenders. This finding also suggests that managers of highly levered firms are likely to improve firms' credit worthiness, according to the debt covenant hypothesis (Watts and Zimmermann, 1986). Our finding is inconsistent with prior literature (Yang et al., 2008). Therefore, our hypothesis H2a is supported.

The coefficient of the independent variable *BIG4* exhibits a negative sign, as expected, and is significant at the 1% level. This finding indicates that the engagement of a large and high-quality auditor (a Big 4 audit company) tends to reduce AEM. This finding may indicate that Big 4 auditors have a reputation to protect (DeAngelo, 1981; Francis and Wang, 2008). In addition, to provide a high-quality audit service, auditors must follow rigorous audit processes and quality-control procedures that only large audit firms may ensure because of their investment in partner education and their worldwide industrial experience. In addition, engaging a Big 4 auditor may be used by firms to signal high financial reporting quality. Our finding is consistent with Van Tendeloo and Vanstraelen (2008) for unlisted firms and with Alzoubi (2016) and Krishnan (2003) for listed firms. Therefore, hypothesis H3a is supported.

The coefficient of the independent variable *SIZE* exhibits a negative sign and is significant at the 5% level and thus larger unlisted firms are less likely to engage in AEM than smaller firms. This finding suggests that large firms have better organized internal control systems than smaller firms. In the case of Italian (both listed and unlisted) firms the administrative audit is carried out by an independent and professional mandatory audit committee, the Board of Statutory Auditors, which maintains significant responsibility in controlling operations and accounting practices to protect minority shareholders and external stakeholders (Mariani et al., 2010). These findings are consistent with Swastika (2013) and Amertha et al. (2014). Therefore, hypothesis H4a is supported.

The coefficient of the independent *TAX* exhibits a positive sign, as expected, and is significant at 5% level. This finding indicates that corporate tax expense drives AEM in countries, such as Italy (Poli, 2013a), where financial and tax accounting are aligned. Therefore therefore unlisted firms are likely to manage accrual earnings for tax purposes (Van Tendeloo and Vanstraelen, 2008). Our finding is consistent with the extant literature, including studies such as Coppens and Peek (2005). Therefore, hypothesis H5a is supported.

The coefficient of the control variable *ROA* exhibits a positive sign, contrary to expectations, and is significant at the 1% level. This finding suggests that profitable firms are more likely than other firms to engage in AEM to match stakeholders' expectations. This finding also indicates that growing firms are likely to manage accruals to signal future firm performance (Wu and Robin, 2012). Our finding is not consistent with Van Tendeloo and Vanstraelen (2008).

The control variable *AGE* has a positive sign, contrary to expectations, and is significant at the 5% level. This finding, inconsistent with prior literature concerning listed firms (Gul et al., 2009; Ahmad et al., 2014), suggests that unlisted firms are not exposed to increased reputational risk compared to other firms.

The coefficient of control variable *ZSCORE* exhibits a positive sign, as expected, and is significant at the 5% level. This finding, consistent with the debt hypothesis, indicates that firms in the distress zone are more likely than other firms to engage in AEM. Our finding is consistent with the prior literature (Agrawal and Chatterjee, 2015). Finally, the coefficient of the control variable *TANG*, gauged using the fixed assets ratio, has a positive sign, as expected, and is significant at the 1% level. This finding, consistent with Chen et al. (2010), indicates that firms investing in high fixed assets are more likely to adjust earnings through AEM technique. The results for Model 2, which employs *REM* as dependent, are shown in the second column of Table 6. The model exhibits an R-square of 40.09%, while the F test is significant at the 1% level. The variance inflation factor value is below 2 for all model variables.

The coefficient of the independent variable *OWN* exhibits a negative sign which is not significant, and therefore inconsistent with the prior literature concerning listed firms (Swai and Mbogela, 2016), while there is no existing empirical evidence for unlisted firms. This finding provides evidence that concentrated ownership does not impact on *REM* as it may cause a transfer of wealth to stakeholders, thereby damaging the shareholders (Garrod et al., 2007). Therefore, H1b is not supported.

The coefficient of the independent variable *LEV* exhibits a positive sign, as expected, and is significant at the 10% level, and thus highly leveraged firms are more likely to engage in REM (Zang, 2012). According to the debt hypothesis (Watts and Zimmerman, 1986), higher levered unlisted firms are more likely to manage earnings than firms that are not leveraged by using an EM technique that is hard to detect by lenders (Graham et al., 2005). Our finding is consistent with Hoang and Phung (2019). Therefore, hypothesis H2b is supported. The coefficient of the independent variable *BIG4* exhibits a negative sign, contrary to expectations, which is significant at the 1% level. This finding suggests that Big 4 audited firms are less likely to engage in *REM* than other firms. Our finding is not consistent with the prior literature (Cohen and Zarowin, 2010; Chi et al., 2011). This suggests that in unlisted firms, big audit companies have the effect to constrain real activity-based earnings management since such firms are simpler to audit than listed firms. Therefore, H3b is not supported. The coefficient of the independent variable *SIZE* exhibits a consistent with the extant literature concerning listed

Table 7. Robustness tests (linear panel regression using TEM as the dependent variable).

Variable	Exp. sign	Coeff.	p-value	sign
Constant		0.065	0.000	***
OWN	+	0.002	0.240	
LEV	+	0.037	0.017	**
BIG4	-	-0.021	0.000	***
SIZE	-	-0.007	0.000	***
TAX	+	0.003	0.032	**
ROA	-	-1.038	0.000	***
AGE	-	-0.001	0.586	
ZSCORE	+	0.017	0.005	***
TANG	+	-0.029	0.000	***
Model specification:				
R-square: 18.42%				
F (15,75,311) = 93.17				
Prob> F= 0.000				
VIF < 2% for all variables				
Industry control: yes				

This table reports the linear panel regression for Equation 11 (Model 3). *** = significant at the 1% level (2-tailed); ** = significant at 5% level (2-tailed), and * = significant at the 10% level (2-tailed). Standard errors are robust (Petersen, 2009), and clustered by both firm and year. Variable measurement and details are provided in Table 2.

firms (Swai and Mbogela, 2016; Vakilifard and Mortazavi, 2016).

Contrary to expectations, the variable *TAX* exhibits a positive sign, even though it is not significant. This result is inconsistent with the prior literature (Marques et al., 2011), and therefore, H5b is not supported. As *REM* is more complex to implement than *AEM* (Graham et al., 2005; Cohen and Zarowin, 2010), unlisted firms may find it simpler to engage in the latter. Therefore, taxation is evidently not associated with *REM* initiatives as suggested by Garrod et al. (2007). As expected, the control variable *ROA* exhibits a negative sign which is significant at the 1% level. Thus, profitable firms are less likely than other firms to manipulate earnings. This finding indicates that profitable firms do not engage in *REM* since it destroys cash flows and firms' value, causing a transfer of firms' wealth from shareholders to stakeholders. In addition, since abnormal cash flows and abnormal production costs are absorbed across the years (in contrast to accruals), the engagement in *REM* may impact negatively on the future performance of firms. The coefficient of the control variable *AGE* exhibits a negative sign, as expected, which is significant at the 10% level. This finding indicates that old firms are less likely to engage in real activity-based EM since they are exposed to reputational risks more than other firms (Ahmad et al., 2014). Our finding is consistent with the prior literature (Gui et al., 2009). The sign of the control variable *ZSCORE* exhibits a positive sign, as expected, and is significant at the 10% level. According to the prior literature (e.g. Altman, 2000), firms with financial difficulties, are more likely to engage in REM, consistent with the debt hypothesis. Finally, the coefficient of the control variable *TANG* exhibits a negative sign, as expected, and is significant at the 1% level. This finding suggests that the investment in tangible fixed assets does not impact on REM.

Robustness tests

Finally, consistent with Fields et al. (2001), we regressed the extent of total earnings management (TEM), against the independent variables in Equations 9 and 10. Here, *TEM* is the total sum of AEM and REM. In this way, we examine the determinants of overall EM behavior in unlisted firms. Thus, Model 3 in Equation 11 uses *TEM* (total earnings management) as the dependent variable. The model results are shown in Table 7.

$$TEM_{i,t} = \alpha_i + \beta_1 OWN_{i,t} + \beta_2 LEV_{i,t} + \beta_3 BIG4_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 TAX_{i,t} + \beta_6 ROA_{i,t} + \beta_7 AGE_{i.t} + \beta_8 ZSCORE_{i.t} + \beta_9 TANG_{i.t} + \varepsilon_{i.t} \quad (11)$$

Model 3 has an R-square value of 18.42%, indicating that the firm characteristics explain 18.42% of the variability of the dependent variable *TEM*. This R-square is higher than that in Model 1 and lower than that in Model 2, both given in Table 6. Model 3 indicates that the dependent variable *TEM* is positively related to the variables *LEV*,

TAX, and *ZSCORE* at the 5%, 5% and 1% levels, respectively, while the variables *OWN* and *AGE* are insignificant. The variable *TEM* is significantly negatively related to the variables *BIG4*, *SIZE*, *ROA* and *TANG* at the 1% level. These findings indicate that both higher leverage and greater financial difficulties lead to greater overall earnings management (that is, the sum of AEM and REM). These findings, consistent with Mafrolla and D'Amico (2017), suggest that high-indebted firms are more likely to manage earnings. Big 4 audited firms are less likely to engage in earnings management initiatives as such auditors constrain earnings management (DeAngelo, 1981). More profitable firms engage less in EM since these firms have less incentive to do so. Corporate tax drives positively *TEM*. This finding provides evidence that unlisted firms manage earnings for tax purposes (Ball and Shivakumar, 2005). Consistent with prior literature (Swastika, 2013; Amertha et al., 2014), larger firms engage less in EM initiatives than other firms because of their better internal control systems than smaller firms, consistent with Swastika (2013) and Amertha et al. (2014). Finally, the control variable *TANG* negatively affects the overall measure of earnings management (*TEM*).

Conclusions

In this paper, we set out to study the firm level determinants of accrual-based and real activity-based EM for a large sample of Italian unlisted firms over the years 2011-2018 in order to analyze which are incentives to management to engage in AEM and/or REM earnings management techniques. To capture accrual-based EM, we employ the Dechow et al. (1995)'s model, while we capture REM using abnormal cash flows and abnormal production costs. Garrod et al. (2007) find that concentrated unlisted firms are likely to manage AEM while such firms do not manage REM since it causes a wealth transfer from shareholders to stakeholders, even though REM is harder to detect than AEM (Zang, 2012).

We estimate two models to examine the determinants of earnings management: an accrual-based EM model and a real activity-based EM model. Further, following Fields et al. (2011), a robustness test analyzes the drivers of total earnings management. Our hypothesis development is based on key potential drivers identified in the EM literature, including ownership concentration, firm leverage, auditor type, firm size, tax burden, and firm profitability, the latter employed as a control variable.

Our key findings are summarised as follows. In terms of AEM, ownership concentration in unlisted firms is a positive driver, according to the entrenchment hypothesis. As firm equity is typically owned by only a few investors, then the quality of published financial information becomes less important to them. As expected, firm leverage is a positive driver, suggesting that firms manage earnings to avoid violations of debt covenants. Larger auditors (Big 4 audit companies) are more likely to constrain AEM than other auditors given their expertise and desire to maintain their reputations. Firm size is a negative driver, suggesting that larger firms have a well-organized and well-structured internal control system, reducing incentives for managing accruals. Consistent with prior literature (Burgstahler et al., 2006) taxation is a positive driver of AEM. Finally, for the control variables, firm profitability positively drives AEM which confirms the greater need of firms to manipulate earnings as their profitability increases. Firm age, financial difficulties, and the tangible fixed assets ratio are all positive drivers of AEM, consistent with the previous literature.

For our REM model, ownership concentration does not drive REM since it transfers wealth from shareholders to stakeholders. Big 4 audited firms are likely to constrain REM because they control for abnormal cash flows, one of the proxies of REM. Firm leverage is a positive driver of REM, suggesting that higher levered firms have more incentives to improve their credit worthiness. Firm size and firm age negatively drive REM. Financial difficulties, consistent with the debt hypothesis, is a positive driver of REM. Taxation does not impact REM, consistent with Garrod et al. (2007). Overall, when we compare the two models, we can confirm our general hypothesis that Italian unlisted firms engage in both AEM and REM techniques, especially for lending purposes, since leverage and financial distress indicators drive positively both AEM and REM.

For robustness, according to Fields et al. (2001), we introduce total earnings management (TEM) as a dependent variable to capture the overall measure of earnings management. The findings confirm the analysis of the main Models 1 and 2, suggesting that leverage and financial difficulties are drivers of overall earnings management behaviour, while taxation only impacts AEM, confirming that a firm's tax payment is a political cost transferring wealth from owners to stakeholders (e.g. the tax authorities).

Firm size is a negative driver of overall earnings management since large firms are more likely to have well-organized internal control systems. Further, the engagement of a Big 4 audit company is likely to constrain earnings management. Firm profitability is a negative driver of TEM as in Model 2, indicating that profitable firms are less likely to manage earnings opportunistically. Finally, as expected, the tangible fixed assets ratio is a negative driver of TEM.

Our paper has implications for both academic researchers and practitioners. Our results suggest that Italian unlisted firms engage in both AEM and REM. We provide evidence on the firm characteristics such as ownership concentration, leverage, auditor type, firm size, and tax position which influence earnings management practice. In particular, our findings suggest that both academics and standard setters should focus

on both AEM and REM incentives in preparing accounting standards and enforcing the role and the skills required of the board of statutory auditors. Understanding the ways in which firms manage their earnings may help in the prevention of such practices in the future, and facilitate the strengthening of domestic accounting standards to also detect REM initiatives. There are two main limitations to our study. The first is that we are not able to use all three metrics of REM suggested in the seminal literature (Roychowdhury, 2006) due to limitations in the format of the financial statements for Italian unlisted firms and the non-mandatory disclosure of R&D expenses. The second limitation is that our research does not analyze the trade-off between both earnings management techniques (AEM and REM) that may indicate the non-simultaneous use of earnings management techniques.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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