

# The Influence of Top Manager's Age Diversity on Firm Performance: The Moderation Effect of Top Manager's Average Age

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**To cite this article:** Kimario, J. L. (2024). The Influence of Top Manager's Age Diversity on Firm Performance: The Moderation Effect of Top Manager's Average Age. *Business Management Review*, 27(1), 118-131. <https://doi.org/10.56279/bmrj.v27i1.8>

## Abstract

*This study examines the effect of top managers' team age diversity on firm performance and the moderation effect of top managers' average age on the top manager's age diversity and firm performance. The study used quantitative data from 63 listed firms on East African stock exchanges. It used hierarchical linear modeling to test the hypotheses. Results indicated that the main effect of top managers' team age diversity is statistically significant and positively related to firm performance as measured by ROA. Furthermore, the moderation effect of top managers' average age is statistically significant but negatively moderates the relationship between top managers' age diversity and firm performance. The study theoretically contributed to upper-echelon literature by introducing other theories— the information and decision-making theory, and the socioemotional theory that collaborates with upper-echelon literature to explain the effect of top managers' age diversity on firm performance as moderated by the average age of top managers. The innovation of this study comes from extended knowledge of the micro-contextual factor, which has been used to moderate this relationship.*

**Keywords:** Performance, Age Diversity, Average Age, Life Span Theory, Socio-Emotional Selective Theory.

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## **Introduction**

In recent years, organizational demography and strategy researchers have drawn attention to top management team (TMT) diversity constructs on firm outcomes (Hambrick, 2007). They are debating whether TMT diversity enhances firm outcomes, especially for visible constructs (Tomohiko et al., 2017; Tomohiko & Yuhee, 2018; Griffin et al., 2021; Kin & Tiong, 2022). Diversity refers to the variation of visible characteristics of top managers, such as age, gender, race, education level, and nationality (Hambrick & Mason, 1984). According to (Cox, 1994), TMT diversity theoretically increases TMT members' creativity and problem-solving capabilities.

Realistically, many researchers have found that TMT diversity positively and negatively impacts firm performance processes. For example, TMT diversity is associated with cognitive benefits such as enhanced creativity and performance, and affective costs such as key personnel turnover (Boone et al., 2004). In top management teams, TMT diversity includes TMT age differences. Therefore, this study aims to examine TMT age differences.

Nowadays, top management teams have managers with more age differences than other attributes such as gender, race, or nationality (Krishnan et al., 2017; Bashir et al., 2021). Top management age distribution is changing fast with the emergence of top executive search firms and the decline of the traditional employment contract whereby promotion to senior position is based on terms of service and seniority. Current employers can hire both extremes of top management age distribution (Tomohiko et al., 2017). Consequently, top management teams are characterized by managers of different ages. Today, managers of various age distributions work with different values, perceptions, and conventions. Given this fact, we believe that TMT age diversity is an essential demographic characteristic worth researching in the upper-echelon literature. Decomposing TMT diversity and focusing exclusively on TMT age diversity will fine-tune the literature and deepen analysis that is consistent with other literature on TMT diversity (Orlando & Roger, 2011).

Specifically, studies after Hambrick & Mason, (1984) have tried to uncover TMT diversity's effects on firm performance. However, the findings of these studies have inconsistent results; results range from positive results (Ozer, 2010) through nonsignificant (Nielsen & Nielsen, 2013) to negative (Tomohiko et al., 2017). Following suggestions of TMT meta-analysis done by Hambrick (2007) and Joshi & Roh (2009) and the inconsistent findings in the literature, current researchers are attempting to find the contexts under which TMT diversity is embedded (Tanikawa & Jung, 2016). In the literature, the macro contexts, such as environment uncertainties (Richard & Shelor, 2002) are examined; however, the micro contexts, such as TMT average age, are under-examined (Nielsen & Nielsen, 2013).

Several studies have not considered TMT average age as a potential moderating variable of TMT age diversity and firm performance. They believed that the two variables are collinear because they are generated from the same TMT members, but in the actual sense, they are not. According to life span theory, TMT average age and TMT age diversity are not collinear because age represents the maturity of an individual (Parry & Urwin, 2011). Individuals of different ages have different values, beliefs, and different management and communication styles. Even though firms can have the same level of TMT age diversity, functional diversity

derived from them differs because such functions depend relatively on the average age of top managers, who comprise the majority of top management teams. Given this argument, it is expected that the average age of top managers is an essential micro-level contextual factor to be examined in this relationship. In this study, an important question to be addressed is: Where does TMT age diversity lie? Is it at the low age or high age of TMT members? To address this question, the present study examines the role of top managers' average age on top managers' age diversity and firm performance relationships.

The study contributes to upper-echelon literature by providing additional evidence to the existing body of knowledge about TMT diversity. Prior studies have omitted TMT average age in their studies (Homberg & Bui, 2013) while others have used it as a control variable (Sabine et al., 2011) and only a few have used it as a diversity variable (Richard & Shelor, 2002; Ozer, 2010). In the present study, we have decomposed TMT diversity and exclusively studied the effects of age diversity on firm performance. Our findings have collaborated with other findings in the TMT literature that TMT age diversity positively impacts firm performance (Richard & Shelor, 2002; Ozer, 2010). Generally, such findings and literature are missing in developing economies.

Further, the study examined the moderation effect of average age on top managers' age diversity and firm performance relationship. Prior studies have examined macro contextual factors such as the environment and industry settings, leaving the micro context such as TMT average age unexamined. The findings of this study reveal that life span theory and social-emotional theory complement upper echelon theory by explaining the impact of top managers' average age on age diversity and firm performance relationship.

## **Literature Review**

### ***Top Management Age Diversity and Firm Performance***

The concept of TMT diversity is extended into the upper echelon theory (Hambrick & Mason, 1984). According to upper-echelon theory, the demographic characteristics of top managers are proxy measures of their values, beliefs, perceptions, and experience. Top managers' psychological constructs influence the firm's strategic decision-making, subsequently impacting its performance. In the present study, TMT age refers to the number of years an individual has lived since he/she was born (Wang et al., 2016) while diversity refers to the distribution of TMT constructs (Orlando & Roger, 2011). Given that top managers differ in their psychological constructs, understanding the effect of top managers' age diversity on firm performance is vital.

TMT age diversity is viewed as an asset for the firm to enjoy rather than a liability to the firm. TMT diversity is a source of skills, knowledge, experience, and competencies available to top management team members (Harrison & Klein, 2007). Differences in age between individual managers mean more comprehensive resources available to the firm. Realistically, the more differences in top teams, the more resources are available to address the firm's challenges. The differences in values and perception derived from age differences increase TMT creativity, innovation, problem-solving techniques, and quality of strategic decision-making (Tanikawa & Jung, 2016). Overall, there is empirical evidence that heterogeneous top teams perform better than homogeneous teams (Orlando & Roger, 2011). And since top teams are

responsible for strategic decisions of the firm, their overall performance as top teams impacts firm performance.

Prior studies about the top team's diversity done by Shouming, Miao, Sibin and Xin (2015); Tanikawa and Jung (2016), Tomohiko et al. (2017) and Yaqun, Hermann, Xiaoming and Zelong (2017) have found that top team diversity offer capabilities for creativity, innovation, and better problem-solving techniques. It means that diversity produces a variety of ideas, options, and alternatives to solve the firm's challenges. For example, Pelz (1956) studied social factors related to the performance of scientists and engineers. Results revealed that scientists and engineers with dissimilar values cooperated informally, and their productivity was high compared to those of scientists and engineers with similar values.

In contrast, other researchers have argued that top team diversity constructs negatively affect firm performance (Tomohiko et al., 2017). They argued that the concept of age diversity is related to group relations (Tajfel & Turner, 1979). Their argument is built on the premise that the differences between people provide the basis for people to categorize themselves based on age, gender, race, education level, or nationality. This categorization in top teams results in top management diversity. As a result, heterogeneous top teams may find it challenging to work together due to distorted communication, different management styles, and less cooperation. As a consequence, heterogeneous TMT ends up performing poorly compared to homogeneous TMT.

While there are conflicting results about top management age diversity and firm outcomes such as performance, in the present study, we expect a positive relationship between TMT age diversity and firm performance (Williams & O'Reilly, 1998; Van Knippenberg & Van Ginkel, 2010) because TMT diversity is viewed as an asset for the firm to enjoy (Harrison & Klein, 2007). Based on the theoretical argument and the empirical literature, we hypothesized that:

*H1: Top managers' age diversity is positively related to firm performance.*

### ***The Moderation Effect of Top Managers' Average Age***

The positive and negative perspectives of TMT age diversity and firm performance are rooted in upper-echelon literature. All these perspectives bring intuitive sense and are grounded on well-established theories, yet the theories have arrived at differently opposing directions. In addition, some studies have provided evidence of TMT age diversity with positive performance (Van Knippenberg & Van Ginkel, 2010) while others have negative performance (Tomohiko et al., 2017). In the upper-echelon literature, none of these perspectives is reliably supported. Following the meta-analysis of Hambrick (2007), Horwitz & Horwitz (2007) and Joshi & Roh (2009), it was suggested that TMT diversity constructs are highly variable factors ranging from positive to negative. That is why Milliken and Martins in 1996 to say that TMT diversity is a double-edged sword. As a result, Milliken & Martins, (1996) suggested a need to identify contexts that better explain the relationship between TMT diversity and firm outcomes – to find out how to weild the double-edged sword.

Because of inconsistency findings in the literature that range from positive (Richard & Shelor, 2002) through nonsignificant (Nielsen & Nielsen, 2013) to negative (Tomohiko et al., 2017),

some researchers have attempted to find various contexts under which this relationship is embedded. For instance, Carpenter, (2002) has argued that the effect of TMT diversity is reflected in firm performance after considering contextual factors that affect this relationship. Following a similar line, the present study uses top managers' average age as a micro-level context to explain better the effect of top manager age diversity on firm performance. Prior studies have tried to explain this relationship using macro context factors such as the environment or industry settings (Tanaka et al., 2018). However, the micro-level contexts, such as TMT average age are under-researched.

Drawing from life span theory, we expect TMT average age to moderate the relationship between TMT age diversity and firm performance. The life span theory assumes that individual values, perception, experience, management, and communication style change with maturity. This suggests that even though firms may have the same level of TMT age diversity, their TMT functions differ because such functions derived from TMT age diversity will depend on the age of top managers who make up most of the top management teams. Many studies have shown a significant effect of TMT average age on firm performance (Kor & Misangyi, 2008; Tanikawa & Jung, 2016). Such evidence indicates that TMT average age can be used as a micro-level factor to moderate TMT age diversity and firm performance relationship.

In the present study, an important question to be addressed is: Where does TMT age diversity lie? Is it at the low age or high age of TMT members? To address this question, we employ the socio-emotional selective theory to answer this question. This theory argues that individuals have two goals to pursue in life, the knowledge acquisition goal and the emotion regulation goal (Ng & Feldman, 2010). According to the theory, younger managers are riskier and seek more knowledge acquisition goals because they have plenty of time. In contrast, old managers are more risk averse and tend to seek more emotion regulation goals because they feel that time is not with them anymore. Because of this, old managers experience more fulfillment in social activities than young managers (Ng & Feldman, 2010). In this case, old managers are more effective in handling interpersonal situations than young managers. Old managers respond better to organizational problems with better solutions than young managers and are unlikely to get into counterproductive behaviors (Ng & Feldman, 2010). This is to say that old managers are better at handling the affective conflicts of TMT age diversity than young managers. In this study, we expect top managers with relatively high average age to moderate the relationship between top managers' age diversity and firm performance. Based on theoretical literature – life span theory, the socio-emotional theory, and the empirical literature we hypothesized that:

*H2: The top managers' average age moderates the relationship between top managers' age diversity and firm performance.*

## Methodology

### *Data*

This study used a dataset from listed firms in East African stock markets. The dataset comprises 63 firms from 8 industrial sectors from 2008 to 2017. This is the time where many firms were listed in the East African Exchange stocks, and one that exclude the COVID 19 effects. The 63 firms are considered sufficient for this study (Tarus & Aime, 2014). Data about TMT demographic characteristics was collected from firms' annual reports obtained from the African Stock Exchange Association and missing data was collected from the firms' websites. Data about firm performance was extracted from the OSIRIS database.

In this study, TMT members are units of our analysis. TMT literature has defined TMT in various ways. The upper-echelon studies have used a different range of definitions. For example, Bertrand and Schoar (2003) defined TMT as the five most paid top managers, Fredrickson & Iaquinto (1989) as the top tier of the firm's management, Carpenter & Fredrickson (2001) as all executives listed in the annual report of the firm. In this study, we adopted and used the TMT definition given by Carpenter & Fredrickson (2001).

### *Measures*

The dependent variable – firm performance, as measured by ROA. ROA refers to a ratio that measures the return of assets to the firm. ROA ratio was measured at the end of the firms' financial year. The study used ROA to measure performance because it is the only measure with a complete data set for measuring firm performance from the OSIRIS database. TMT demographic characteristics were measured at the beginning of the firms' financial year. This approach helps to overcome the causality effect of our variables (Hambrick, 2007). Further, to eliminate the performance of the single-year error or outlier, the average ROA was calculated, i.e., the average of  $ROA_{t+1}$  and  $ROA_{t+2}$  (Cannella et al., 2008).

The independent variable – TMT age diversity was measured by the coefficient of variation (Maria & Maria, 2014; Tomohiko et al., 2017). The coefficient of variation is calculated as standard deviation over its mean. The moderating variable – TMT average age is calculated as the average age of TMT members from the reference year 2008 (Tanikawa & Jung, 2016). Finally, we control variables likely to influence firm performance, including tenure diversity, education diversity, firm size, TMT size, and firm leverage. TMT nationality diversity and TMT education diversity were measured by the Blau index (Tanikawa & Jung, 2016; Tomohiko & Yuhee, 2016; Tomohiko et al., 2017), while the coefficient of variation measured tenure diversity.

Firm size is measured as a logarithm of total assets. The logarithm of total assets is widely used to measure firm size in the empirical literature (Adams & Ferreira, (2009); Luckeath-Rovers, (2013); Isidro & Sobral, 2015 and Kilic & Kuzey, 2016). Large firms have stable revenue streams and perform better than small firms. Additionally, large firms have big-scale operations, giving them more advantages in overcoming structural and financial problems. Finally, the firm size can explain the level of nationality diversity and performance differentials among firms.

TMT size is measured as the number of top managers at top management (Certo et al., 2006; Ling & Kellermanns, 2010). Firms with a relatively high size of TMT are likely to have a high chance of recruiting foreigners in top management, which results in a high level of TMT nationality diversity. Top management with a high level of TMT nationality diversity increased managerial capabilities and abilities, which influences the quality of decision-making, subsequently affecting firm performance.

Firm leverage is measured as the ratio of a firm's total debt over total assets. In academic literature, firm leverage is considered as a tool to discipline managers to work in the interest of firm owners. For example, Llyukhin (2015) found a significant negative relationship between leverage and firm performance when examining the influence of financial leverage on Russian companies' performance.

***Analysis***

We employ hierarchical linear regression to test our hypotheses and assess the R square changes at each stage. We use order 1, 2, and 3 to test hypotheses, i.e., Model 1 for control variables, model 2 for independent variables, and model 3 for the moderating variable. Note that models 2 and 3 have included the control variables as well. To reduce the risk of multicollinearity, nationality diversity, age diversity, tenure diversity, and education diversity were mean-centered (Hamilton, 2006).

**Results**

Table 1 presents hierarchical regression results for our hypotheses. To test hypothesis 1, we entered the independent variable TMT age diversity on model 2, which also included the control variables. Results reveal that TMT age diversity is statistically significant ( $\beta = 12.66$ ,  $\rho = 0.01$ ) and positively related to firm performance as measured by ROA. Results support hypothesis 1 and are consistent with the findings of other studies (Van Knippenberg & Van Ginkel, 2010).

**Table 1: Hierarchical Linear Regression Results**

	Model 1	Model 2	Model 3
TMT Size	-0.01***	-0.01***	-0.01***
Log (Assets)	2.06**	2.31**	2.6**
Firm Leverage	-0.03	-0.02	-0.02
TMT Tenure Diversity	1.62***	1.59***	1.52***
TMT Education Diversity	-2.25*	-2.21*	-2.27**
TMT Nationality Diversity	8.17	9.56*	9.68**
TMT Average Age		.26***	.24***
TMT Age Diversity		14.37***	12.66***
Age diversity*Average			-1.32**
Observations	516	515	515
R-squared	0.15	0.17	0.18
R-square change		0.02	0.01
Industry dummy	YES	YES	YES

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

To test hypothesis 2, we generated the interaction term of top managers' age diversity and TMT average age. The generated interaction term was entered into model 3, which also has the independent and control variables. The moderation results are statistically significant ( $\beta = -1.32, \rho = 0.05$ ). Hypothesis 2 is supported and consistent with prior studies (Tomohiko & Yuhee, 2016). However, the moderation effect has weakened this relationship, as explained by Peni (2012).

From Table 1, the average age has successfully moderated the relationship between age diversity and firm performance. However, the direction of this moderation is contrary to what has been hypothesized in the empirical literature. From the empirical literature, it was expected that managers with relatively high average age would strengthen this relationship rather than weaken it. Even though this relationship has been weakened, its effect on this study is modest because age diversity and firm performance as measured by ROA are least correlated, as indicated in the correlation matrix table. This makes the study provide more practical contributions in the business context than theoretical contributions.

**Figure 1: The Moderation Effect of TMT Average Age on the Relationship between TMT Age Diversity and ROA**

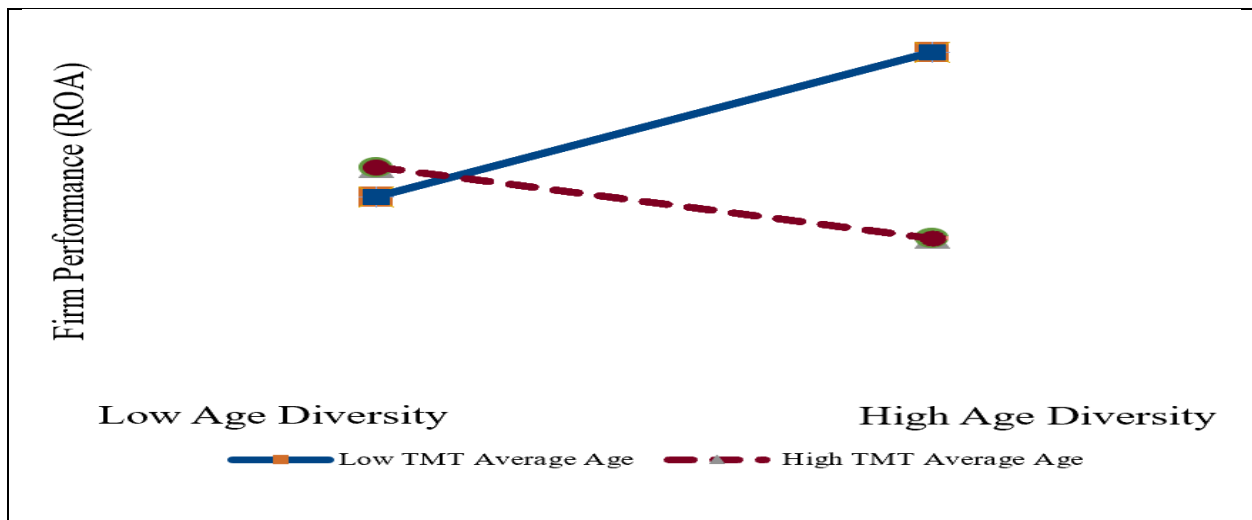


Figure 1 details the moderation effect of top managers' average age on the relationship between top managers' age diversity and firm performance. The graph shows that managers with relatively high average age cannibalize the benefits of age diversity that would improve the quality of the decision-making process within the firm, which would ultimately enhance the firm's overall performance.

## Discussion

This study examined the moderation effect of top managers' average age on top managers' age diversity and firm performance relationship. The study first found a significant positive relationship between the main effect of top managers' age diversity and firm performance, which is consistent with prior studies (Richard & Shelor, 2002; Ozer, 2010). Since TMT diversity does not affect firm performance in the same way (Nielsen & Nielsen, 2013), the



present study has added valuable evidence to the existing upper-echelon literature on the basis that top managers' age diversity is positively related to firm performance.

Furthermore, the study examined the moderation effect of top managers' average age on top managers' age diversity and firm performance relationship. The findings are statistically significant and collaborate with other empirical findings (Tanikawa & Jung, 2016; Tomohiko et al., 2017). However, such a moderation effect has weakened this relationship. This phenomenon in the context of emerging economies can be explained by two reasons. The first reason is that relatively aged managers dominate top management teams in emerging economies. This is evident in our dataset, where the overall average age of TMT members is 59 years. The second reason is that aged managers tend to demonstrate the stereo-typed behavior of conservatism (Peni, 2012). They are rigid in their work attitudes and resist innovative changes that are beneficial to the firm and likely to spring from younger managers (Weiss & Maurer, 2004). Such an argument is supported by prior studies, such as Peni, (2012) who argued that relatively high-age managers are conservative and resist innovations.

The results are evident that age diversity increases firm performance. In the business context, age diversity exerts knowledgeable benefits, causing performance to increase, mainly when the top team is geared to perform specific strategic tasks. An indirect benefit of age diversity is when management integrates their values, beliefs, and perceptions towards everyday tasks regardless of their age heterogeneity. This, in turn, increases the degree of social interaction, which ultimately increases firm performance. It has been seen that firm performance increase is associated with top management heterogeneity whereby age diversity gives complementary effort to top teams. This complementary effort enables managers to perform more than when working on a homogeneous team. As a result, the heterogeneity team's overall performance surpasses the homogeneity team's results. This is to say that a top team with managers of different ages would perform better because of the interaction among managers of different values, perceptions, and personality traits. In turn, the age heterogeneity team can make quality strategic decisions, ultimately enhancing firm performance.

While age heterogeneity enhances firm performance, its negative effect is in the form of group conflict. Top managers with relatively high average ages within the firm are expected to minimize such conflict. In the context of developing countries, such phenomena are not present. It has been shown that top managers with relatively high average ages are rigid in modifying their management style, which refers to a rigid management style in decision-making within top teams. In return, this jeopardizes top team flexibility, creativity, and innovations, particularly for young managers, ultimately leading to rigid problem-solving or decision-making processes that hinder the firm's performance.

Conclusively, age diversity increases the distribution of human resources within the firm. The implicit increase of this resource is an increased bank of knowledge and skills for a firm to use to improve its performance. Such resource is reflected in the firm through increased facilities, technology, or practical management style for problem-solving. Therefore, the firm should ensure that its costs do not outweigh the benefits of age diversity and should ensure that such resource is maintained and shared by maintaining adequate degrees of age heterogeneity within the top teams.

Contrary to cannibalizing the benefits of age diversity, aged managers should serve as mentors of efficient codes of conduct by socializing with young managers and documenting good unwritten codes of conduct by the young managers, which are likely to improve firm performance. Managers with relatively high average age are encouraged to create a conducive environment for problem-solving within the firm. The conducive environment will unleash the benefits of age diversity by letting young managers exercise their skills and creativity to improve the quality of strategic decisions, ultimately improving firm performance.

## **Conclusion**

This study sheds light on the nuanced relationship between top managers' age diversity and firm performance. The findings underscore the positive impact of age diversity on firm performance, aligning with prior research in the field. However, the moderation effect of top managers' average age has been found to weaken this relationship, particularly in the context of emerging economies where older managers dominate top management teams. This implies that the presence of age diversity within top management teams contributes to increased firm performance through various mechanisms. It fosters knowledge sharing, facilitates diverse perspectives in decision-making, and enhances social interaction among team members. This complementary effort among managers of different ages leads to superior strategic decision-making and ultimately boosts firm performance.

While age diversity brings significant benefits, it also poses challenges such as group conflict, particularly in environments with rigid management styles exhibited by older managers. However, rather than viewing age diversity as a hindrance, organizations should leverage the expertise of older managers as mentors to young managers, fostering a conducive environment for problem-solving and innovation. In managing age diversity, organizations must strike a balance to ensure that the benefits outweigh the costs. Maintaining adequate degrees of age heterogeneity within top teams is crucial for harnessing the full potential of age diversity. Additionally, fostering collaboration and knowledge transfer between managers of different age groups is essential for maximizing firm performance. Generally, this study emphasizes the importance of recognizing and leveraging age diversity within top management teams as a strategic asset for enhancing firm performance. By embracing age diversity and promoting intergenerational collaboration, organizations can unlock new opportunities for innovation, creativity, and sustainable growth in an increasingly competitive business landscape.

This study has not ended without some limitations. First, the study used only ROA to measure the dependent variable. Future studies should try to include other dependent variables measures such as ROE (Maria & Maria, 2014), percentage of sales change (Orlando & Roger, 2011) and Tobin q. Including alternative measures of firm outcomes will allow future researchers to explore different moderation or mediation variables likely to affect top managers' age diversity and firm performance relationships. Second, the study examined the moderation effect of top managers' average age on the relationship between top managers' age diversity and firm performance without measuring the processes likely to affect TMT members' strategic decisions. Therefore, the present study did not measure the processes that could result in cognitive benefits or affective costs. Besides, prior studies such as Nielsen,

(2010) have criticized such omission, therefore future studies should try to include such processes.

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