



THE ROLE OF ADAPTIVE ABILITY IN FIRM PERFORMANCE: MODERATING EFFECT OF FIRM SIZE AND AGE



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ABSTRACT

Article History

Received: 19 April 2019

Revised: 22 May 2019

Accepted: 25 June 2019

Published: 23 July 2019

Keywords

Performance

Adaptive capability

MSMEs

Firm Size

Firm age.

JEL Classification:

J24; L20; L21; L25; L26.

This paper explores the relationship between adaptive capability and firm performance to determine if corporate managers' adaptive capabilities could directly impact firm performances. The proposed conceptual model was tested with the moderating effects of firm size and age. An empirical study tested the conceptual model of a batik-industry sample of Indonesian MSMEs. The author used the Generalized Structured Component Analysis (GeSCA) online software program. Empirical findings revealed that adaptive capability could have a positive and significant effect on business performances. These positive relationships tend to decrease when the corporate size is large and have existed for a long period of time. Managers therefore must realize that adaptive capability is needed to improve business performance. It should also be noted that the size of the firm and the age of the firm can reduce the relationship between the two variables.

Contribution/Originality: This study is one of the few studies to investigate adaptive abilities that have a role in the performance of MSMEs in Indonesia and to investigate the moderating effects of firm size and age.

1. INTRODUCTION

The difference in firm performance depends on the ability of the adaptation, namely the firm's efforts to understand and adapt to threats and opportunities from environmental change (Grant, 1991; Urban and Star, 1991; Walker *et al.*, 1992; David, 1993). Adaptive capability can be defined as the capability to identify and utilize emerging market opportunities (Miles and Snow, 1978; Chakravarthy, 1982; Hooley *et al.*, 1992). Thus companies that have high adaptive levels will be able to take advantage of opportunities and perform better. (Bourgeois, 1980; Snow and Hrebiniak, 1980). This ability to improve performance is important for Indonesian companies because ASEAN countries were expected to implement economic integration by the end of 2015. Not only will integration lead to higher competition in the domestic market but also additional opportunities abroad. These conditions indicate that environmental changes are currently taking place and marking the sign of hypercompetitive (Liebeskind *et al.*, 1996; D'Aveni, 1998).

In a dynamic environment, flexibility is needed, and must be supported by the right adaptive capability as a controller (Biedenbach and Söderholm, 2008). In strategic literature it is generally argued that strategic choice depends on how closely a business is aligned with its environment (Hofer and Schendel, 1978; Porter, 1980).

Therefore, in order to create a competitive advantage, the firm must be able to respond to this change much faster than its competitors. Roberts and Grover (2012) although organizations have a limited ability in understanding and overcoming this reality (Day, 2011).

The effort to understand a firm adapting to environmental challenges and opportunities is a topic of academic research that has long been discussed in literature. Initially, research has shown that the process of organizational adaptation is related to firm actions and decision-making processes when facing market conditions (Miles and Snow, 1978; DeSarbo *et al.*, 2005). This has made adaptability an inseparable part of strategic actions, leading to the reconfiguration of organizational resources, competencies and routines to capture opportunities from changes happening in the business environment (Teece *et al.*, 1997; Ambrosini and Bowman, 2009; Teece, 2012).

The majority of the literature on adaptive capability discusses the consequences of adaptive capability on firm performance. Bourgeois (1980) stated that the main benefit of adaptability is that it can improve performance. Hooley *et al.* (1992) found that highly-adaptable companies will perform better than other companies. Several other studies also showed that adaptive capability has a positive effect on organizational performance (Oktemgil and Gordon, 1997; Wei and Lau, 2010; Biedenbach and Müller, 2012; Eshima and Anderson, 2017). However, Snow and Hrebiniak (1980) showed that at a certain point, market adaptation also plays role in performance, but not necessarily in all dimensions of performance.

The seemingly unpredictable consequences of adaptive capabilities indicates that more research on this particular subject is still needed. Although efforts in understanding how companies adapt to environmental change are increasing, there is still a lack of development in this field of research. Ambrosini *et al.* (2009) stated that more work on the topic of capability were needed, especially those involving unique and specific environments. These environments should not be always exclusively generated by external factors such as market, competitors and government policy but could also include internal environments. As an example, the internal environment could be in the form of size (Carr *et al.*, 2010) and age (Rafiq *et al.*, 2016) or both (Huang *et al.*, 2013; Radipere and Dhliwayo, 2014). Unfortunately, the number of studies that specifically examine the moderating effects of organizational age and size and their relations with adaptive abilities and performance are still very rare, even nonexistent. Therefore, to fill this gap, it was critical for a new study focusing on the influence of the internal environment on adaptive capability to be developed (Kaehler *et al.*, 2014).

The effectiveness of the organisation's size in influencing firm performances has long been debated. Some studies posited that smaller organizations should have a stronger impact while the others argued the opposite (Mintzberg, 1973; Hambrick and Mason, 1984; Hambrick, 1989; Koene *et al.*, 2002). Vanpoucke *et al.* (2014) showed that firm size can influence the implementation of corporate environmental practices because larger companies have more resources to reduce environmental stress than smaller companies.

Some scholars have agreed that the age of the firm would likely determine the growth of the firm. They claimed that the critical level the company would go through would decrease over time, whereas the survival ability would increase along with the age of the firm. Unknown, newly established companies would be normally unable to achieve economies of scale and would have insufficient resources and managerial expertise while time and growth would make them more reliable in coping with such problems.

However, previous empirical studies showed that the age of the firm did not provide conclusive evidence in relation to performance. According to Sørensen and Stuart (2000) and Zahra (2003) a more experienced and older firm can produce more innovation than younger companies but generally only on incremental innovation and lower quality. Withers *et al.* (2011) stated that older companies have a higher level of innovation than younger companies and concluded that the age of the firm plays an important moderating role when examining the performance of MSMEs. Innovation would also improve firm performance (Fruhling and Keng, 2007).

This study examined the degree of adaptive capability of MSMEs and their impact on their performance. The research also examined the relationship between adaptive capability and its effect on performance when moderated by size (total sales, total employees, total assets) and experience (firm age).

2. LITERATURE REVIEW

2.1. Adaptive Capability

The discussion of strategic capabilities is framed through a resource-based view (RBV). The RBV claims that organizational growth depends on how companies collect their resources and use them (Penrose, 1959). Further research has expanded on the RBV by adding the concept of capability (Richardson, 1972) or combining individual skills with organizational capabilities (Nelson *et al.*, 1982). The RBV states that competitive advantage is created from differences in resource allocation and ability (Peteraf, 1993).

Adaptive capability represents the firm's internal capacity as the core of the response (Ansoff *et al.*, 1976). It refers to the capability of a firm to coordinate quickly and reconfigure resources in response to sudden environmental changes (Gibson and Birkinshaw, 2004) while maintaining previous performance (Aggarwal *et al.*, 2016; Kaur and Mehta, 2017). The adaptive capability has been understood as a capability related to problem-solving and responding to customers (Hakansson, 1982) which are characterized by three areas of organizational activity: the firm's response to customer-market opportunities, marketing activities to respond to these opportunities, and a rapid response in pursuing these opportunities.

This capability can be achieved through a mechanism that allows one to try to identify and resolve problems collectively and effectively. Therefore SMEs must be able to build adaptive capability by analyzing changes in market trends and allocating appropriate resources (Oktemgil and Gordon, 1997). MSMEs must have adaptive capabilities needed to replace old traditions and routines with new ones (Akgün *et al.*, 2012) and must have the ability to respond to changes in accordance with organizational priorities (Wang and Ahmed, 2004). Thus MSMEs that have adaptive capabilities are able to identify and take advantage of opportunities offered in the market (Tseng and Lee, 2014; Hofer *et al.*, 2015). Therefore, by having this adaptive capability, MSMEs can monitor customers and markets (Morgan *et al.*, 2003) and subsequently adapt products, prices, promotions and distribution, and develop new markets and products (Filipe and Montgomery, 2004; Wang and Ahmed, 2004; Hultman *et al.*, 2009; Ahn, 2017).

2.2. Firm Performance

Firm performance can be viewed through several different perspectives. Firm performance is a measure of how a manager utilizes organizational resources efficiently and effectively to achieve organizational goals and satisfy all stakeholders (Jones and George, 2009). This can be measured by two concepts, namely objective concepts based on absolute performance measurements and subjective concepts based on self-reported measurements. Objective measurements are directly taken from external reports that are recorded and audited using absolute measurements; while subjective measures are based on respondents' assessment of their firm's performance (Wall *et al.*, 2005).

The growth rate is one measure of firm performance based on the belief that growth is a precursor to achieving sustainable competitive advantage and profitability (Markman and Gartner, 2002). Firm performance can be assessed using financial and non-financial measures (Martín-Consuegra and Esteban, 2007; Panigyrakis and Theodoridis, 2007). Besides that the measurement of firm performance can use sales growth (He and Wong, 2004; Wu *et al.*, 2006), employment growth (Baum *et al.*, 2000), and growth in the premises (Morris *et al.*, 2006).

2.3. Conceptual Framework and Hypotheses

2.3.1. Adaptive Capability and Performance

Although it is said that the achievement and application of adaptive capabilities are very expensive (Zammuto, 1982; McKee *et al.*, 1989) this can provide the main benefits of improving performance (Bourgeois, 1980; Snow and Hrebiniak, 1980). This relationship is supported by several studies showing that adaptive capability affects organizational performance (Wei and Lau, 2010; Biedenbach and Müller, 2012; Eshima and Anderson, 2017). Some researchers found that highly-adaptable companies seem to perform better than other companies, but Snow and Hrebiniak (1980) concluded that while market adaptation was positively related to performance up to a certain point, that at a higher level, there was a negative relationship.

Miles and Snow (1978) argued that there were no significant differences between types of strategies with respect to performance, which were supported by the empirical study by Slater and Narver (1994) where there were no significant performance differences in various organization strategies. Even though empirical conflicts occur, all the objectives of adaptability are to pursue market opportunities, develop and enhance marketing activities, and respond to environmental changes faster than competitors, so that performance can be eventually improved. Referring to the understanding of some researchers, it could be stated that any adaptive capability possessed by a firm is a source for achieving competitive advantage (Powell, 1992; Powell, 1995) and a source of corporate innovation (Adeniran and Johnston, 2012). Therefore, we proposed the following research hypothesis:

H₁: Adaptive capability has a positive effect on MSMEs performance.

2.4. The Effect of Firm Size on the Relationship between Adaptive Capability and Performance.

Firm size and resources are two important aspects in terms of the relationship between components of adaptive capability and performance (Aldrich and Ellen, 1986; Baker and Cullen, 1993; Wales *et al.*, 2011). The effectiveness of managing an organization that depends on firm size has long been debated (Mintzberg, 1973; Hambrick and Mason, 1984; Niresh and Velnampy, 2014) whereas the relationship between firm size and performance has been considered ambiguous (Ramasamy *et al.*, 2005). Therefore it is necessary to consider industry specifications and case-by-case studies to avoid generalization.

The literature shows that large firms are more bureaucratic and more formal than smaller organizations (Child, 1972; Weber, 1978) leading them to create formal decision standards (Baker and Cullen, 1993) which cause structural inertia and inflexibility (Hannan and Freeman, 1977; Hannan *et al.*, 2002). The structural inertia helps the firm carry out stable exploitation rather than pursuing exploration. If this situation exists in the firm, the exploration strategy of large companies is hindered. Therefore, it is possible that firm size has a negative effect on firm performance. This idea was supported by Palangkaraya *et al.* (2009) who stated that larger and older companies were less productive.

The firm size in this study was also introduced as a moderator in the relationship between adaptive capability and firm performance. Previous research has shown conflicting evidence about the relationship among organizations, innovation, and firm size. Some studies have suggested that larger organizations may be more suitable for pursuing innovation than smaller companies (Baldrige and Burnham, 1975) but evidence of the reverse has also been found (Blau, 1979). We argued that firm size is a key contextual variable in the study of adaptive capability in relation to firm performance.

Koene *et al.* (2002) found that in smaller organizations, the success of organizational management has a stronger impact than in larger ones. Peteraf (1993) and Wernerfelt (1994) argued that the key difference in strategy and level of performance among competitors is a unique firm characteristic that produces core competencies. Firm size is one of the factors that can influence the implementation of management practices to respond to environmental changes. The larger firm has more resources but receives greater environmental pressure than a smaller firm (Vanpoucke *et al.*, 2014). Chung *et al.* (2003) stated that as an adjustment variable, organizational size

influences the relationship between the management model and organization development. Therefore, we proposed the following research hypothesis:

- H_{2a}*: The total employees negatively affects MSMEs performance.
- H_{2b}*: The total assets negatively affects MSMEs performance.
- H_{2c}*: The total sales negatively affect MSMEs performance.
- H_{3a}*: The total worker moderates the relationship between adaptive capability and MSMEs performance.
- H_{3b}*: The total assets moderates the relationship between adaptive capability and MSMEs performance.
- H_{3c}*: The total sales moderates the relationship between adaptive capability and MSMEs performance.

2.5. The effect of Firm Age on the relationship between Adaptive Capability and Performance

One of the inherent characteristics in a firm is experience (Carr et al., 2010). This experience can increase with age, that is how long the firm has been operating (Morgan et al., 2004). The greater the experience of a firm, the better its understanding of market trends and the more business opportunities it can take advantage of (Ahn, 2017). Therefore, companies that operate longer will gain more experience and more resources so that they will be better at responding to environmental changes (Carr et al., 2010). New companies are more likely to fail than older ones, due to the lack of experience, established routines, and available resources.

Previous research showed that new businesses tended to be adaptable and responsive in reallocating and mobilizing their resources (Oviatt and McDougall, 1994). They were better than established companies because they had the ability to vicariously learn which is a requirement for success and then they used this knowledge to produce performance growth (Autio et al., 2000). With flexibility and adaptive capability, new businesses can quickly decide to move forward in order to realize the goals of growth. Consistent with an aging perspective which states that younger companies can experiment and identify or adopt successful competitive recipes, they can accelerate their entry into different markets and achieve their growth goals. In addition, younger companies tend to invest adequately in anticipating and exploring new opportunities (Massis et al., 2014). When younger companies choose to enter new markets, they can sometimes take advantage of their capabilities and successfully transfer experience to new markets. Finally, higher growth can be realized after new capabilities are available (Sapienza et al., 2006). Based on this perspective, we argued that the age of the firm has a negative moderating effect on the relationship between adaptive capability and firm performance. This study also tested whether younger companies performed better than the older ones and whether the relationship between adaptive capability and firm performance was stronger in younger firms. Therefore, we proposed the following research hypothesis Figure 1:

- H₄*: Firm age has a negative effect on MSMEs performance.
- H₅*: Firm age moderates the relationship between adaptive capability and MSMEs performance.

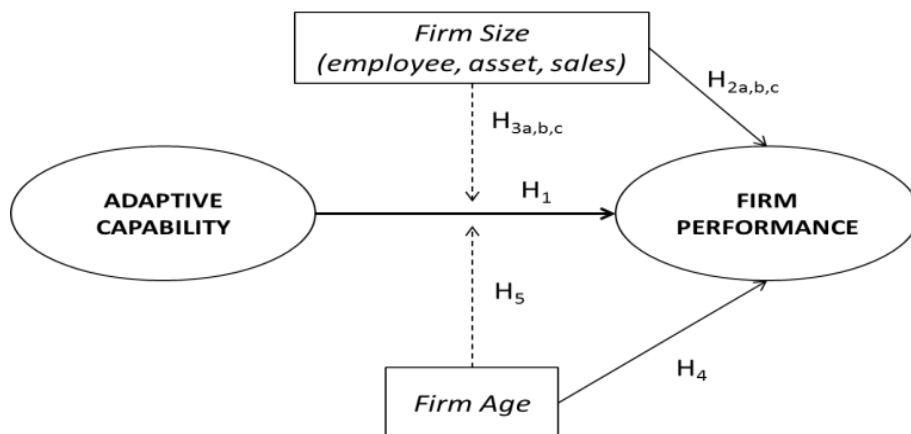


Figure-1. Conceptual Model.

Source: Suggested by authors based on literature review.

3. METHODOLOGY AND MEASUREMENT

3.1. Data collection

The target population for this study was the UMKM Batik entrepreneur group in Central Java which is divided into three central areas of batik. Data collection was via questionnaires which were completed by MSME owners or authorized managers on a voluntary basis. 198 questionnaires that were filled in completely with sufficient information were selected for the study.

3.2. Measurement

The measurement model refers to an implicit or explicit model that links latent variables to the indicator. The latent variables in this study used reflective multi indicators. The questionnaire used in this study was developed through an extensive review of the available literature on adaptive abilities and the performance of MSMEs including sources such as textbooks, research papers, and academic journals.

Adaptive ability was measured by eight items: monitoring customers and markets (Morgan *et al.*, 2003); product adaptation; price; promotion and distribution; and, the development of markets and new products (Filipe and Montgomery, 2004). Firm performance in this study was measured subjectively based on the manager's perception of the growth of his business. The use of growth as a measure of firm performance is generally based on the belief that growth is a precursor to the achievement of sustainable competitive advantage and profitability (Markman and Gartner, 2002). This growth was measured by 3 items: (1) sales growth, (2) profit growth, and (3) asset growth (Delmar, 1997). These two constructs used a 5-point Likert scale.

The age of the firms were measured by the length of time they were in operation (Sousa *et al.*, 2008; Park and Rhee, 2012). The age of the firms were grouped into three groups (Indonesian Bureau of Statistics): (1) companies that were young (<5 years); (2) intermediate age (5-10 years); and adult age (> 10 years) whereas the size of the firms were measured by total employees, total sales and total assets (Indonesian Bureau of Statistics). Firm sizes were grouped into three groups: (1) micro businesses (with <5 employees); (2) small businesses (with 5 to 19 employees); medium business (with 20 to 99 employees)

3.3. Data Analysis

Data analysis used a detailed analytical approach on the demographic variables such as business location, gender, age, education and number of employees with descriptive analysis. The measurement model and the structural equation model (SEM) were analyzed by using the Generalized Structured Component Analysis (GeSCA) online software program. Both models were used to test the extent to which the measurement model and structural model were in accordance with the sample data. The measurement model or confirmatory factor analysis (CFA) was used to test the extent to which each indicator variable captured the domain of each construct: adaptive ability and firm performance. The structural model was used to test the relationship between latent variables.

4. RESULTS AND DISCUSSION

4.1. Demographics of the Sample Firms

Table 1 shows the results of the analysis of the variables of gender, education and characteristic of the firms. Most of the MSMEs were located in Pekalongan and Surakarta, have been in operation for more than five years, have assets between 50 million to 500 million rupiah, and have a total average sales of 300 million.

4.2. Measurement Model

The measurement model was used to evaluate the validity and reality of each latent variable for convergent validity, discriminant validity, and internal consistency. The results of this analysis are summarized in Table 2 and Table 3.

First, the convergent validity was assessed by reviewing the t-test or critical ratio (CR) for item loading (Anderson and Gerbing, 1988; Kleijnen *et al.*, 2007) Table 2 reveals that all CR were significant at the level of $p = 0.05$. This showed that all indicators effectively measured their constructs.

Second, the discriminant validity referred to the degree of discrepancy between attributes that should not be measured by measuring instruments and theoretical concepts about these variables. The discriminant validity from the reflexive measurement model could be calculated based on the cross loading value of the manifest variable on each latent variable. The discriminant validity could also be calculated by comparing the value of the square root of average variance extracted (\sqrt{AVE}) with the correlation value between latent variables. If the value of \sqrt{AVE} was higher than the correlation value between latent variables, discriminant validity could be considered to have been achieved.

Table-1. Demographics of respondent.

	Classes	N	Percent
Characteristic of respondent			
Gender	Male	112	56,57
	Female	86	43,43
	Total	150	100,0
Education	Primary school	3	1,52
	Junior high school	28	14,14
	Senior high school	100	50,51
	Diploma	22	11,11
	S1	42	21,21
	Master	3	1,52
	Total	198	100,0
Characteristic of firm			
District	Lasem	25	12,63
	Semarang	24	12,12
	Surakarta	71	35,86
	Pekalongan	78	39,39
	Total	198	100,0
Firm age	< 5 years	29	14,45
	5-10 years	85	42,93
	>10 years	84	42,42
	Total	198	100,0
Asset (Rupiahs)	≤ 50 million	37	18,69
	50 - 500 million	111	56,06
	>500 million-10 billion	50	25,25
	Total	198	100,00
Sales (rupiahs)	≤ 300 million	49	24,75
	> 300 million -2,5 billion	84	42,42
	>2,5 -50 billion	65	32,83
	Total	198	100,0

Source: Results from data processing, 2018.

As shown in Table 3, the value of \sqrt{AVE} (mentioned in diagonals) was greater than the correlation coefficient between the latent variables (mentioned outside-diagonally). The \sqrt{AVE} value for constructive ability construct = 0.559 which was greater than 0.220 and the square root value of average variance extracted AVE for the constructs of firm performance was 0.881 and greater than 0.220. Thus, the two constructs were in accordance with the criteria of discriminant validity.

Table-2. Construct reliability and convergent validity.

Variable	Loading		
	Estimate	SE	CR
ADAPTIVE CAPABILITY	AVE = 0.312, Alpha =0.674		
New_product Introduce	0.497	0.086	5.77*
New_market Entrance	0.595	0.07	8.48*
Market_Monitoring	0.407	0.114	3.57*
Competitive_Monitoring	0.624	0.058	10.69*
Product_modification	0.73	0.044	16.5*
Price_modification	0.48	0.092	5.23*
Promotion_modification	0.589	0.081	7.22*
Distribution_modification	0.481	0.093	5.17*
PERFORMANCE	AVE = 0.776, Alpha =0.845		
Profit growth	0.956	0.004	224.95*
Sales_growth	0.956	0.005	182.7*
Asset_growth	0.709	0.058	12.2*

Source: Results from data processing, 2018.

CR* = significant at .05 level.

Table-3. Measurement model: cross-loadings.

Correlations of Latent Variables (SE)		
	ADAPTIVE CAPABILITY	PERFORMANCE
ADAPTIVE CAPABILITY	0.559 ($\sqrt{\text{AVE}}$)	
PERFORMANCE	0.220 (0.079)*	0.881 ($\sqrt{\text{AVE}}$)

Source: Results from data processing, 2018.

4.3. Structural Model and Hypothesis Testing

Model 1 showed that adaptive capability has an estimated value ($b = 0.224$) and a critical ratio ($CR > 2.58$), thus this variable was found to have a positive influence on firm performance as can be seen in Table 4. From this investigation, there was a significant positive effect of adaptive capability on firm performance. Regression analysis argued that strategic planning was a significant input that adds variation to firm performance. This combination strongly supported H_1 , which stated that there is a positive influence between adaptive capability on MSMEs performance, therefore H_1 was supported.

Table-4. Regression of firm performance: additional results by total of employees, asset, sales and age.

Independent variables	Firm performance					
	Model 1		Model 2		Model 3	
	Estimate	CR	Estimate	CR	Estimate	CR
Adaptive Capability	0.224	3.02*	0.207	2.59*	0.958	2.67*
Total employees			-0.126	0.82	1.072	2.38*
Total asset			-0.242	3.13*	1.979	2.43*
Total sales			0.174	1.87	-1.572	1.33
Age			-0.002	0.03	-0.361	0.53
Adapt- Cap* Tot-asset					-2.337	2.61*
Adapt- Cap *Tot-sales					1.943	1.44
Adapt- Cap * Tot-empl					-1.353	2.58*
Adapt- Cap *Age					0.419	0.61
R^2		0.05		0.105		0.254
ΔR^2		0.05		0.055		0.149

Source: Results from data processing, 2018.

CR* = significant at .05 level.

In Model 2, assets had an estimate value ($b = -0.242$) and critical ratio ($CR > 2.58$); worker had an estimate value ($b = -0.126$) and a critical ratio ($CR < 2.58$); turnover had an estimate value ($b = 0.174$) and a critical ratio ($CR < 2.58$); and age had an estimate value ($b = -0.002$) and a critical ratio ($CR < 0.258$). The results of this analysis

indicated that assets had a significant negative effect on firm performance but that other variables (worker, turnover, and age) did not significantly affect firm performance.

H_{2a} , H_{2b} , H_{2c} , and H_4 state that total employees, total assets, total sales, and age negatively affect firm performance. According to the results, total assets have a significant negative effect on firm performance, while total employees, total sales and age were not significant. Thus H_{2a} , H_{2c} , and H_4 were rejected and H_{2b} was accepted. The R^2 change in model 2 showed that total asset, employee, total sales, and total age contributed around 5.5 percent to variations in firm performance.

To test the four moderation hypotheses, the Multi Multiple Regression analysis was used with the GeSCA program software in a three-step approach (Chin *et al.*, 2003). First (model 1), the outcome variable (firm performance) was regressed with the predictor variable (adaptive capability). Second (model 2), the outcome variable (firm performance) was regressed to the four moderator variables (total employees, total assets, total sales, and total age). Third (model 3), the interactions between the moderator variables and the predictor variables were regressed with the firm performance variables.

In model 3, the interaction effects between adaptive capability and total employee, total assets, total sales, and total age on the firm performance were examined. The interaction effect between adaptive capability and the total asset had a strong negative contribution to firm performance ($b=-2,337$, $CR>2.58$). Similarly, the interaction between adaptive capability and the total employee had a strong negative contribution to firm performance ($b=-1,353$, $CR>2.58$). The interaction between adaptive capabilities and total sales and age did not significantly affect the firm's performance. In addition, changes in R^2 indicated that 14.9 percent of firm performance variations were calculated by adding interaction variables (adaptive ability - employee, asset, sales, and age).

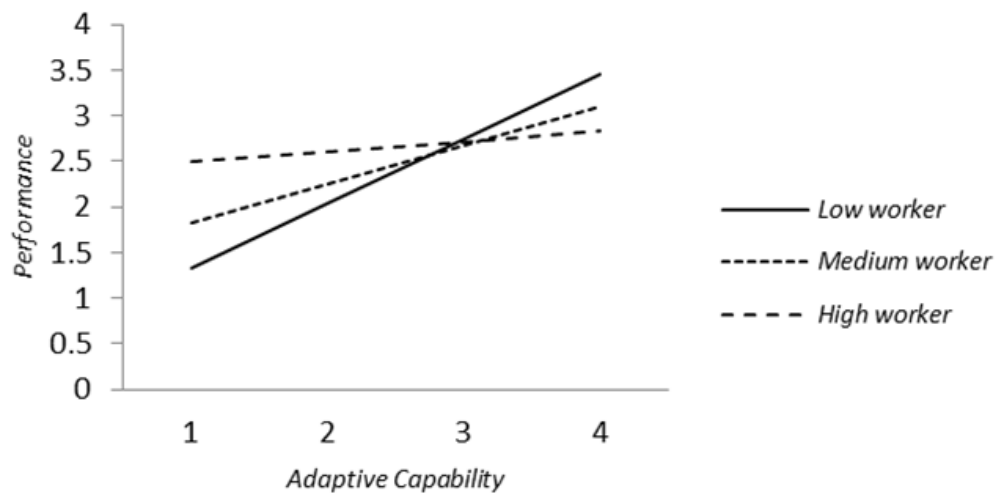


Figure-2. The moderating effect of total on the relationship between adaptive capability and firm performance.
Source: Results from data processing, 2018.

H_{3a} stated that size (total employees) moderated the relationship between adaptive capability and the performance of MSMEs. The findings of this work (model 3) showed that the interaction of adaptive capability with total employees had a negative effect on firm performance. This result means that adaptive stability has a weaker effect on the performance of the firm with an increase in the number of employees. Thus H_{3a} was supported. The interaction plot in Figure 2 showed that with firms that had more employees, the relationship between adaptive ability and firm performance had a flatter slope line than in firms with smaller numbers of employees.

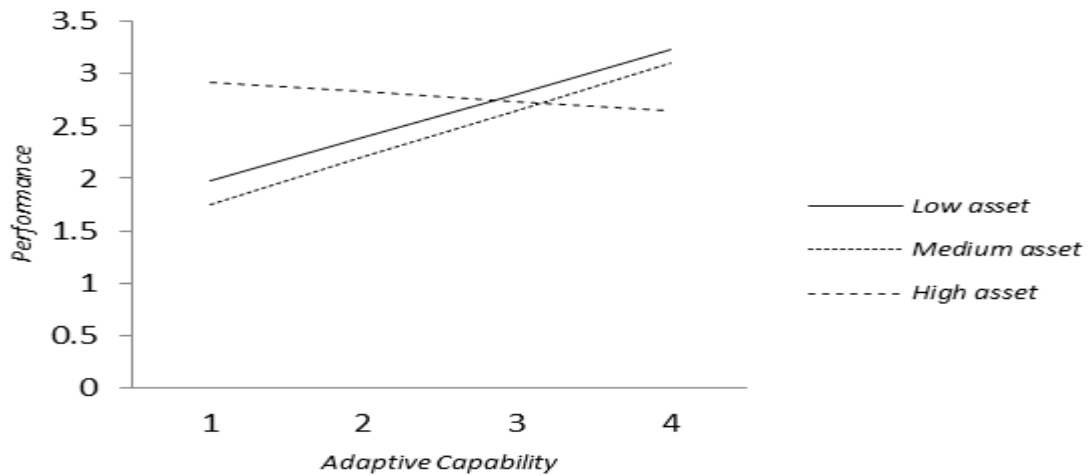


Figure-3. The moderating effect of total asset on the relationship between adaptive capability and firm performance.
 Source: Results from data processing, 2018.

H_{3b} states that firm size (total assets) moderates the relationship between adaptive capabilities and the performance of MSMEs. The results of the analysis (model 3), show that the interaction of adaptive capabilities and total assets has a negative influence on firm performance, so H_{3b} is supported. The interaction plot Figure 3, shows that the group of firms that have larger assets, the slope of the relationship between adaptive capability and firm performance looks flatter compared to smaller firms, even in groups of firms with high assets have a negative relationship.

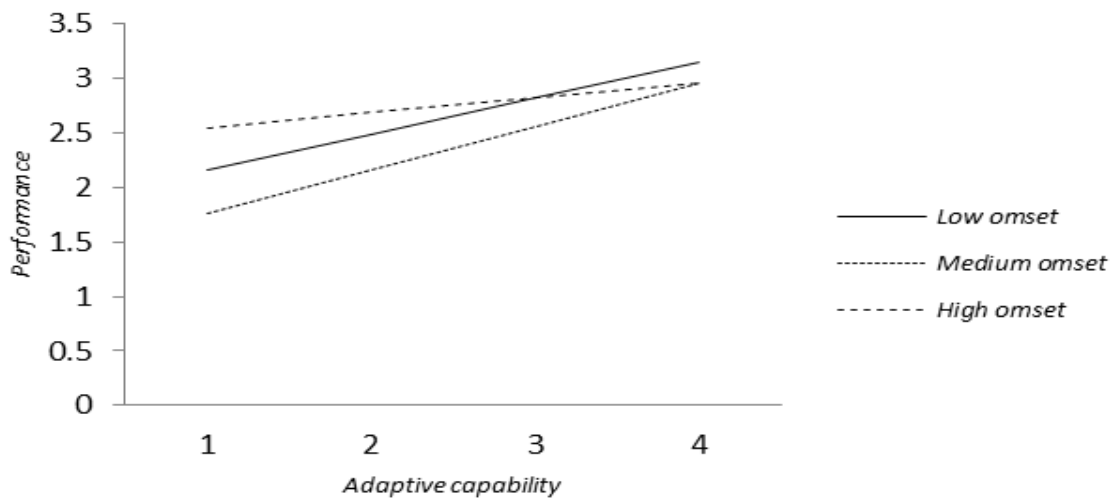


Figure-4. The moderating effect of total sales and age on the relationship between adaptive capability and firm performance.
 Source: Results from data processing, 2018.

The next hypothesis H_{3c} stated that the size (total sales) of the firm moderated the relationship between adaptive capability and the performance of MSMEs. The results for model 3, showed that the effect of the interaction effect of adaptive capability and total sales on firm performance was positively insignificant, therefore H_{3c} was rejected. This conclusion was further confirmed by the interaction plot illustrated in Figure 4, indicating that the medium sales group had a more upright slope line compared to the low and high groups. In contrast, for the companies that had high sales, the slope lines were flatter.

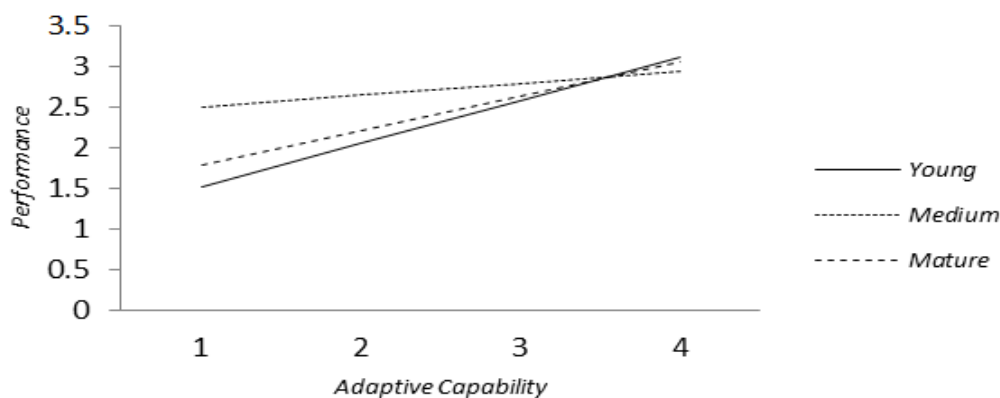


Figure-5. The moderating effect of age on the relationship between adaptive capability and firm performance.
Source: Results from data processing, 2018.

The last hypothesis of H_5 stated that firm age moderated the relationship between the adaptive capability and the performance of MSMEs. The results model 3 showed that the effect of interaction between adaptive and age capabilities on firm performance was positive but not significant, therefore H_5 was rejected. These results were nearly confirmed by the interaction plot illustrated in Figure 5 as the younger age group had a more upright slope line compared to the medium and mature groups, but this difference was not significant.

5. DISCUSSION AND IMPLICATIONS

5.1. Discussion of Findings

Not only did this research aim at connecting adaptive abilities and firm performance but it also explored the link further so that it opened up a discussion by proposing a model that showed the effect of adaptive ability on firm performance moderated by firm size (total employees, assets, and sales) and firm age. Compared with the previous literature, apart from conceptualizing the relationship between adaptive ability and firm performance, this study also provided a more specific vision to the conceptual model by introducing the dynamics of internal characteristics as moderating factors.

The baseline model (Model 1) showed that adaptive ability was positively proven to predict firm performance. Separately, these findings indicated that MSMEs that pursued adaptive capabilities against changes from external environments would affect their firm performance. These results supported Bourgeois (1980) who stated that the main benefit of adaptability is performance growth. These results also supported previous studies which postulated that adaptive capability positively affected organizational performance (Oktemgil and Gordon, 1997; Wei and Lau, 2010; Biedenbach and Müller, 2012; Eshima and Anderson, 2017).

The effect of moderation variables (total employees, assets, sales and firm age) on firm performance (model 2), showed that total employees and assets had a negative significant effect, while total sales and age had no significant effect. These results indicated that firms that have a larger number of employees were more bureaucratic and more formal, thereby reducing the speed of achieving goals and changes (Child, 1972; Weber, 1978). Greater bureaucracy and assets tended to be less flexible, which in turn reduced exploration of new ideas for producing new products and new markets. Smaller firms would be more flexible in using their portfolios and external resources to overcome some obstacles and explore industrial opportunities (Weerdt *et al.*, 2006). However, it should be noted that these results actually contradicted previous studies (Akinyomi and Olagunyu, 2014) which found that firm size, both in terms of total assets and total sales, had a positive effect on profitability in Nigerian manufacturing companies.

The hypothetical relationship between variables related to adaptive capability and firm performance and moderated by firm size (total employees and assets) was supported by the empirical results. The moderating effect of employees and assets was negative. Our findings suggested that firms that operated with more employees and more assets would have slower growth in performance. If this situation exists in MSMEs, the adaptive capabilities

used by larger firms will be hindered. Figure 2 showed that the group of high labor numbers (workers: more than 20 people) had a weaker effect than the middle group (workers: from 5 to 20 employees) and small groups (workers: from 1 to 4 employees). Similarly, Figure 3 showed that in the high asset group (more than 500 million rupiahs) it had a weaker effect compared to the medium group (from 50 million to 500 million rupiahs) and the low group (up to 50 million rupiahs).

Although there was no significant moderating effect of the number of sales Figure 4, it was seen that in the medium group (sales: above 300 million to 1.5 billion rupiahs) the relationship between adaptive capability and firm performance was stronger than in the high group (sales: more than 2.5 billion rupiahs) and small groups (sales: up to 300 million rupiahs). These results were in line with the results of previous studies which showed that smaller organizations were better suited to pursue innovation (Blau, 1979) and performance (Lwango *et al.*, 2017).

The hypothetical relationship between the variable adaptive capability and firm performance moderated by the age of the firm was not supported by empirical results. The moderation effect of firm age was negative but not significant. Our findings indicated that the newer an organization was, the stronger the relationship between adaptive ability and firm performance would be. Conversely, the medium group was weaker than the adult group. These results indicated that at the beginning of the inception of a company, the relationship between adaptive capability and performance seems to be strong, although eventually declining in its medium age, and would subsequently get strengthened again in its adulthood period as seen in Figure 5. These results proved that younger companies tend to invest adequately in anticipating and exploring new opportunities (Massis *et al.*, 2014).

5.2. Managerial Implications

We contributed to the current literature on the performance of firms in two ways.

First, our study increased our understandings on the relations between adaptive capability and firm performances. The main objective of adaptive capability is to improve the performance of firms by adjusting products, the price of promotion, distribution and development of products and markets according to what happens in the external environment.

Second, we looked for conditions in which these effects were intensified or attenuated by considering the characteristics of internal firms. In particular, the positive effects of adaptive capability on firm performance strengthened when a firm was smaller and younger. In conclusion, adaptive capabilities are very necessary for MSMEs because they are proven to improve performance. Efforts to improve adaptive capacity can also be made by analyzing changes in the market environment. Adjustments to product prices, distribution and promotions can also be an option. With this adaptive capability, companies can enter new markets and develop new products faster than their competitors. Decisions made in the context of adaptive abilities tend to have lasting effects on the firm, thus determining the outcome of their decisions.

In addition, our results showed that smaller and younger companies have advantages in terms of adaptability, but that this adaptability may be limited by their own limited resources. Being able to move resources quickly provided more benefits for smaller and younger companies than for their established competitors.

Our findings have limitations. First, our study used data cross-section to measure the adaptive abilities and performance of firms. Therefore longitudinal data and additional steps related to not only economics (profitability), and non-economic objectives are also needed to capture the effects of adaptive capability correctly.

Second, our sample was limited to relatively small and limited batik companies in Central Java. Therefore, the results may not be generalized. Small companies were more likely to be better evaluated on good and bad performance scores due to their invisibility to stakeholders. Large companies may show a different visibility and have different scores. We recommend using a more comprehensive measure of performance to generalize these findings.

Funding: This study received no specific financial support.

Competing Interests: The authors declare that they have no competing interests.

Acknowledgement: Both authors contributed equally to the conception and design of the study.

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