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The Relationship of Environmental Management Accounting, Environmental Strategy and Managerial Commitment with Environmental Performance and Economic Performance

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ABSTRACT

Nowadays, carbon and other ozone harming emanations are one of the fundamental drivers of this overshoot. In the light of this discussion, the current examination aims to investigate the relationship between accounting, management and environment in realizing firm performance. In doing so, the current examination opted to inspect the critical relationship of environmental management accounting (EMA), environmental strategies (ENS) and managerial commitment (MAC) in driving firm performance. Given the concerns within the literature that environmental processing within organization enhance financial costs, the authors of the study are motivated to analyze the impact of the variables on both environmental and economic performance (ECP) of small medium enterprises in Indonesia. We apply novel partial least square structural equation modelling by collected the data from 317 respondents of different small and medium size enterprises of Indonesia. The results of SEM confirm that ECP and environmental performance (ENP) have significantly and positively impacted by ENS. The outcomes of partial least square structural equation modelling also indicate that economic and ENP has also positively and significantly impacted by the EMA. Finally, the results of partial least squares structural equation modeling also specified that ECP and ENP have significantly and positively affected by MAC.

Keywords: Environmental Strategy, Managerial Commitment, Environmental Management Accounting

JEL Classifications: Q55, Q50

1. INTRODUCTION

Environmental condition, at present, is experiencing massive decline. The yearly Earth Overshoot day denotes the day on which human-actuated contamination surpasses the conveying limit the earth accommodates a given year (Qian et al., 2018). This suggested that humans, in the current times, are exerting higher pressures on the ecological atmosphere. Carbon and other ozone harming emanations are one of the fundamental drivers of this overshoot (Mancini, et al., 2016; Haruna and Mahmood, 2018). In addition, industries have been the principle producers of ozone harming substances, in the past as well as in the present. In order to curtail negative ecological effects including carbon

emanations, environmental management has proved to be beneficial (Kaplan-Hallam and Bennett, 2018).

In the field of accounting, environmental management accounting (EMA) has been regarded as the successful notion for reducing ecological burdens in the form of energy dependence and carbon footprints. In similar context, several features of EMA in the form of material flow cost, sustainability balanced score card, and ecological control (eco-control) are found useful in identifying firm's effects on the ecological conditions (Nouri et al., 2019; Jasch, 2008; Henri and Journeault, 2018; Lu et al., 2018). The focus of earlier studies that examined the role of environmental accounting was limited to identifying the costs

associated with firm's processes that can disrupt ecological conditions. In this regard, majority of the studies examined the impact and measurement of environmental costs (Epstein, 1996; Parker, 1997; Jasch, 2003; Gale, 2006; Hye and Jafri, 2011). While the focal point of past natural and social accounting and revealing examination is transcendentally on ecological exposure, EMA has been progressively utilized and explored as an organization's interior management tool to deal with firm's ecological burden and orthodox practices (Qian et al., 2018). Hence, it has been recognized that EMA can assume a critical job in nudging operational impartial as a hierarchical change towards diminishing corporate ecological effects and thereby enhance firm's environmental management practices (Schaltegger, 2018; Hossain et al., 2018).

In addition to firm's supreme emphasis on EMA, the environmental strategies (ENS) of the organizations are articulated and implemented with ecological motivations (Phan et al., 2018). The role of ENS strengthens organizational internal consciousness for improved environmental condition and therefore assist in diminishing negative environmental pressures. Moreover, given the risen environmental regulation, the need for corporations' sound environmental policies and strategies are crucial to protect future growth and market image. In this regard, firm's strategies regarding eco-proficient procedures for curtailing energy dependence along with controlling all form of pollution, recycling material use, utilization of green material, advance technological efficiency to limit the firm's environmental impact is crucial to ensure sustainable development (Aragón-Correa and Sharma, 2003).

Organization's enhanced environmental consciousness cannot be successful in reaching the objective of sustainability without management support. In this regard, managerial commitment (MAC) for ecological improvement is significant to achieve productive organizational growth. In many ecological processes, organizations have to face with difficult tradeoff between monetary benefits and cost increments. Under such condition, the MAC is necessary to strengthen organizational ecologically driven objectives over financial gains. However, many studies believed that firm's efficient environmental policies not only confine the ability to improve environmental performance (ENP) but also boost organizational economic performance (ECP).

Therefore, in the light of above discussion, the current examination aims to investigate the relationship between accounting, management and environment in realizing firm performance. In doing so, the current examination opted to inspect the critical relationship of EMA, ENS and MAC in driving firm performance. Given the concerns within the literature that environmental processing within organization enhance financial costs, the authors of the study are motivated to analyze the impact of the variables on both environmental and ECP of small medium enterprises (SMEs) in Indonesia (Umrani et al., 2017; Hussaini and Muhammad, 2017). The expected outcomes of the study would be useful in lending support to SMEs environmental management policies and help in identifying firm's solution to rising environmental deterioration.

After section one, the later chapter of the investigation presents literature review and identified existing studies regarding environmental management, accounting and performance nexus. Next, in section three, the utilized methods of the study are discussed. Section four of the investigation reported empirical findings and section five presents study conclusion and future recommendations.

2. LITERATURE REVIEW AND HYPOTHESIS

2.1. Environmental Strategies

Environmentally driven strategies can be characterized as a bundle of activities that can decrease the effect of tasks on the ecological atmosphere through goods, procedures and firms policies, for example, curtailing energy dependence and pollution, utilizing renewable sources of energy and implementing ecological management processes (Bansal and Roth, 2000). In the investigations of ENP, the contribution of ENS is prominent. However, for future survivals, the significance of such strategies is also valuable in analyzing their impact on firm's financial performance. In the current stream of literature, many authors analyzed the nexus of ENS and performance. Among them, Aragón-Correa et al. (2008) examined the link between ENS-performance of small firms in Spain. Using the data of 108 vehicle garages, the outcomes of the investigation reported the critical role of ENS in terms of innovation driven and eco-efficient practices. The outcomes of the analysis found the significant relationship of both ENS to enhance small firms' performance in Spain.

In another investigation, Claver-Cortés et al. (2007) also examined the association between ENS and performance of resorts in Spain. Analyzing the data of 153 hotels, the authors of the analysis reported that ENS do not strongly drive firm performance in Spanish hotel industry. On the other hand, Venkatraman and Prescott (1990) also analyzed the significant alignment of environment and firm strategies to influence firm performance. The findings of the investigation established that environment strategies amalgamation is significant in the process of driving organizational performance. In particular, the authors stated that environment-strategy coalignment is significant to bring positive change in organizational performance.

Focusing on innovative ENS, Prajogo (2016) analyzed the contribution of ecologically driven firm's innovation strategies in enhancing firm performance. For this, the authors used the data of 207 organizations of Australia. The outcomes of the investigation found support for the significant link between ecologically driven firm strategies and performance. In particular, the results suggested that process innovative strategies and product innovative strategies are augmented firm performance in both medium and large enterprises.

Hence, the present examination postulates the following hypotheses;

- Hypothesis-1: ENS are significant to drive firm's ECP
- Hypothesis-2: ENS are significant to drive firm's ENP.

2.2. Environmental Management Accounting

The motives of sustainability are impractical if achieved without the co-ordination of managers, departments and firm's owners. The amalgamation of departmental collaboration in the modern business practices is evident to ensure success. In this regard, EMA proved to be the efficient tool that combines the productive capacities and capabilities of information technology, management and accounting to fulfill firms' organizational and environmental goals (Keho, 2017; Johnstone, 2018). The aspects of EMA is useful in delivering ecological management by providing internal and external data availability to strengthen environmental and corporations' decisions.

In the prevailing literature, very limited examinations analyzed the role of EMA in driving performance. The majority of the existing EMA literature is focused to environmental disclosure and cost measurements (Epstein, 1996; Parker, 1997; Gale, 2006). Among such investigations, Jasch (2003) explored the contribution of EMA in realizing firm's environmental costs. Using the sample data of accounting subdivisions, the findings of the investigations established the noteworthy contribution of EMA in realizing firm's environmental costs (Jermsittiparsert, 2016).

Moreover, Qian et al. (2018) also analyzed the contribution of EMA in assisting carbon management (CAM) along with firm's discloser capacity quality (DSQ). For this, the authors used the data of four industrialized nations of Germany, Australia, USA and Japan. Assessing 114 firm, the outcomes of the examination found the role of EMA to be crucial in supporting CAM and improving DSQ. In addition, Phan et al. (2018) also studied the importance of EMA in affecting organization's ENP (Jermsittiparsert et al., 2019). Studying the sample of 208 Australian firms, the results of the examination support the significant role of EMA practices in driving firm's performance.

In a recent analysis, Latan et al. (2018) assessed the role of EMA in detail. The authors investigated the direct impact of EMA in influencing organizations ENP and also the contribution of other ecologically driven factors to impact both EMA and firm's ecological performance. Analyzing the data of 107 manufacturing companies of Indonesia, the authors established that EMA is significant in driving firm's ENP. For the rest of the variables, the study also found the significant role of EAS and MAC in influencing organizational ENP.

Thus, the current study aims to test the following hypotheses;

Hypothesis-3: EMA is significant to drive firm's ECP

Hypothesis-4: EMA is significant to drive firm's ENP.

2.3. Managerial Commitment

Many studies explored the connection between firms' potentials for growth in terms of performance measures and commitment of their workforce. Focusing on MAC, Vento et al. (2016) examined the relationship between MAC, HR development and firm's monetary performance in Mexico. Utilizing the observation of 234 employees, the findings of the study confirmed the significance of MAC in predicting performance. In specific, the results stated that

increase in MAC is likely to increase firm financial performance in Mexico.

Moreover, Gong et al. (2009) and Haseeb et al. (2019) also inspected the relationship among HRM, commitment and performance. For this, the authors used the data of 463 organizations of China. In particular, the statistical results tested the effects of HR in their drive for performance and maintenance on managers affective and continuance commitment; that subsequently impact firm performance. The results of the analysis confirmed the significant role of performance-oriented HR and maintenance oriented HR practices in enhancing affective and continuance MAC respectively. Furthermore, the results of the study confirmed the significant relationship of affective MAC in augmenting firm performance. However, the results of the examinations failed to find the significant statistical link between continuance MAC on organization performance.

In another examination, Abdallah et al. (2016) lined MAC to innovation with firm performance and customer satisfaction. The study utilized the data of 214 firms of Brazil, Italy, Austria, Sweden, Germany, USA, Japan, Spain, China, Korea and Finland. The empirical results tested the both direct and indirect effects on MAC on firm performance and customer satisfaction. In specific, the findings established that MAC improved firm operation performance. Also, the outcomes confirmed the positive role of MAC in influencing the association of performance and customer satisfaction. Furthermore, Nakos et al. (1998) also reported the positive link between commitment and export performance of SMEs in Greece. Focusing on ecological conditions, Latan et al. (2018) examined the role of top management commitment on ENP. The results of the analysis found the significance of management commitment in driving firm's ENP.

Thus, the current examination hypothesizes the following;

Hypothesis-5: MAC is significant to drive firm's ECP

Hypothesis-6: MAC is significant to drive firm's ENP.

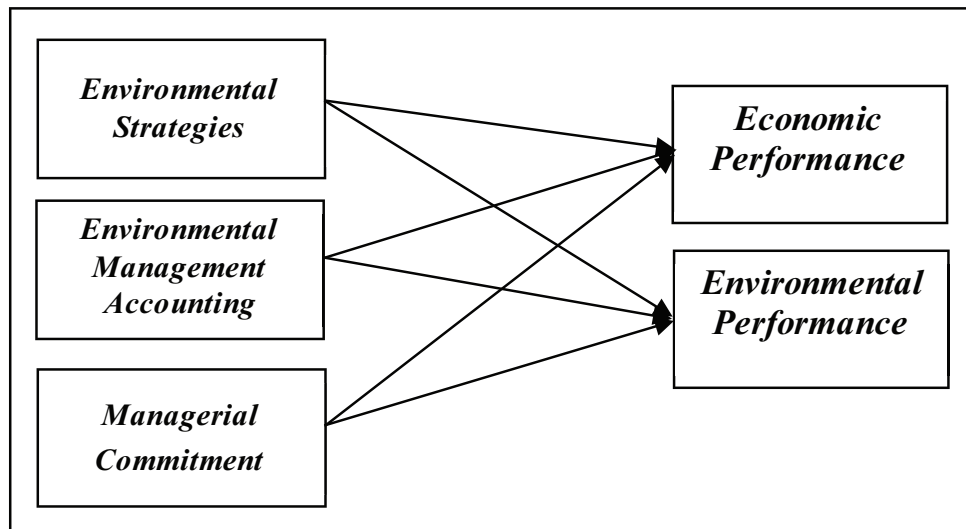
The research model for the current study is displayed in Figure 1.

3. METHODOLOGY

The method of information collection in the present study is finished by collecting the data from the SMEs firms of Indonesia. In addition, we select 79 distinctive SMEs of Indonesia. For fast and flat information gathering process, we make a comprehension of our review survey into the English language and send to the selected different SMEs. In this way, a total of 372 sample was gathered to using both printed and soft copy of the survey. The method for data gathering took a period of 4 months, 2 weeks and 4 days and gathered 357 survey questionnaires with the response rate of 95.96%.

The current study investigates the impact of ENS, EMA and MAC on economic and ENP in Indonesia. To achieve this goal, the current study looks at the research model based on prior investigations, and the model is displayed in Figure 1. The essential attributes of the variables are explained by utilizing the Likert

Figure 1: Conceptual model



scale technique from 5 (strongly agree) to 1 (strongly disagree). Technical speaking, the current study uses five variables. The variables used into this study are the ENS, EMA, MAC, ECP and ENP. The items of these variables are also adopted from the previous studies. The four items of (ENS) are taken from the earlier study of Latan et al. (2018). Moreover, the four items of (EMA) are also adopted from the prior research of Latan et al. (2018). Furthermore, the four items of (MAC) are taken from the past research of Latan et al. (2018). The four items of (ECP) are adopted from the earlier research of Zhu et al. (2016). Finally, the four items used in this study are take from the past study of Zhu et al. (2013).

4. DATA ANALYSIS AND INTERPRETATION

In the current study, the data investigation is done by using two statistical programming which is the SmartPLS Version 3.2.8 (Haseeb et al., 2019; Ringle et al., 2015) and Statistical Package for Social Sciences (version-23). The last information taken for the present examination is 317 subsequent to taking out univariate and multivariate exceptions. The strategy for perceiving of univariate and multivariate exceptions are Z-test score and Mahalanobis Distance (D2) by using SPSS (V-23) and further information examination is finished by applying SmartPLS. Shown Table 1 is the structure and organization of the final collected data utilized in this examination. Furthermore, Table 2 reported the mean and Pearson's Correlation of the components utilized in the current study. Also, to deal with the issue of multicollinearity, we pursue the investigation of Hair et al. (2010) begin that by a broad range in Pearson's Correlation examination should underneath 0.90. Subsequently, confirm the nonappearance of multicollinearity among the variables (Hair et al., 2013; Frooghi et al., 2015).

The results of descriptive statistics are reported in Table 1 with complete structure and composition of the collected data. The descriptive statistics is further divided into four different sub-categories which are gender, age, work experience and education. Table 1 explains the percentage decomposition of all the sub-categories.

Table 1: Descriptive statistics

Descriptive statistics		Frequency	Percent
Gender			
Valid	Female	112	35
	Male	205	65
	Total	317	100
Age			
Valid	20-30 years	45	14
	31-40 years	178	56
	41-50 years	58	18
	51 and above	36	11
	Total	317	100
Working experience			
Valid	1-5 years	45	14
	6-10 years	192	61
	11-15 years	38	12
	More than 15 years	42	13
	Total	317	100
Education			
Valid	Undergraduate	38	12
	Graduate	234	74
	Post Graduate	15	5
	Others	30	9
	Total	317	100

Source: Authors estimation

Table 2: Means and Pearson correlations, (n=317)

Variables	Mean	ENS	EMA	MAC	ECP	ENP
ENS	4.028	-				
EMA	3.878	0.372**	-			
MAC	4.213	0.401**	0.311**	-		
ECP	4.016	0.327**	0.294**	0.324**	-	
ENP	4.009	0.292**	0.336**	0.377**	0.482**	-

**Correlation is significant at the 0.01 level (2-tailed).

Additionally, content legitimacy is built up if the items using in the data examination load with high values in their specific factor in comparison with the items appeared in the model, while internal consistence is acknowledged if the estimation of Cronbach's alpha and composite reliability value discovered more noticeable than 0.7 (Hair et al., 2013; Waseem et al., 2013). Factor loadings and composite reliability value are showed up in Table 3 which

Table 3: Measurement model results

Variable	Items	Factor loadings	Cronbach's alpha	Composite reliability	AVE
Environmental strategy	ENS1	0.889	0.893	0.846	0.603
	ENS2	0.858			
	ENS3	0.905			
	ENS4	0.925			
Environmental management accounting	EMA1	0.868	0.903	0.867	0.633
	EMA2	0.833			
	EMA3	0.844			
	EMA4	0.838			
Managerial commitment	MAC1	0.840	0.936	0.863	0.611
	MAC2	0.818			
	MAC3	0.872			
	MAC4	0.789			
Economic performance	ECP1	0.851	0.884	0.825	0.592
	ECP2	0.809			
	ECP3	0.761			
	ECP4	0.809			
Environmental performance	ENP1	0.828	0.890	0.833	0.618
	ENP2	0.819			
	ENP3	0.790			
	ENP4	0.771			

Source: Authors Estimation. AVE: Average variance extracted

demonstrate that a smooth estimation of the items factor loadings more clear than 0.7. Additionally, these loadings appear in their individual parts which ensuring the inner consistency of the selected construct.

Moreover, convergent legitimacy explains to what degree an item as for a specific factor loaded to other factors where they expected to be loaded (Mehmood and Najmi, 2017). In this investigation, convergent legitimacy is displayed by using an average variance extracted (AVE) for each factor (Fornell and Larcker, 1981). They give the benchmark of more fundamental than and reported differently in association with 0.5 for ensuring the convergent legitimacy. The consequences of AVE in Table 3 is ensuring the fundamental parameters.

In the further stage, discriminant legitimacy is revealed as how much an item of a factor is discriminant and novel from other variables used in a model (Frooghi et al., 2015). As indicated by Fornell and Larcker (1981), the discriminant legitimacy is said to be established if the AVE square root value is more than the pair-wise relationship of the unidentified factor (latent variable). The results appeared in Table 4, bold and italic values are the square root of AVE which is more than the off-diagonal value which are the pair-wise relationship of each factor. Additionally, Table 5 shows the factor loadings of an alternate and individual factor, in like manner, articulating the cut-off benchmark. So likewise, the discriminant legitimacy is additionally affirmed if the Hetro Trait and Mono Trait parameter are lower than 0.85 as proposed by Henseler et al. (2015). The outcomes in Table 6 uncovered that all factors have Discriminant validity.

In the final step, we related a partial least square system to research the model structure and hypothesis testing which showing path coefficients, t-stats, and significance value. As showed up by Chin (1998) proposition, a bootstrapping system utilizing 1000 sub-test was related with confirming the quantifiable key assessments of the considerable number of values. Table 7 uncovers beta coefficients,

Table 4: Discriminant validity Fornell-Larcker criterion

Variable	ENS	EMA	MAC	ECP	ENP
ENS	0.777				
EMA	0.381	0.796			
MAC	0.306	0.286	0.782		
ECP	0.442	0.412	0.392	0.769	
ENP	0.319	0.395	0.336	0.409	0.786

Source: Authors estimation

Table 5: Results of loadings and cross loadings

Variable	ENS	EMA	MAC	ECP	ENP
Environmental strategy	0.889	0.235	0.327	0.159	0.332
	0.858	0.383	0.249	0.233	0.281
	0.905	0.097	0.183	0.211	0.315
	0.925	0.325	0.314	0.252	0.342
Environmental management accounting	0.183	0.868	0.426	0.195	0.258
	0.159	0.833	0.259	0.398	0.219
	0.097	0.844	0.189	0.349	0.245
	0.238	0.838	0.214	0.261	0.317
Managerial commitment	0.216	0.252	0.840	0.201	0.277
	0.340	0.161	0.818	0.219	0.356
	0.168	0.161	0.872	0.202	0.313
	0.312	0.384	0.789	0.140	0.272
Economic performance	0.325	0.270	0.168	0.851	0.283
	0.226	0.342	0.339	0.809	0.400
	0.255	0.418	0.316	0.761	0.283
	0.138	0.312	0.262	0.809	0.244
Environmental performance	0.350	0.209	0.177	0.242	0.828
	0.251	0.170	0.257	0.301	0.819
	0.293	0.250	0.386	0.279	0.790
	0.283	0.392	0.183	0.319	0.771

Source: Authors estimation

t-statistics, and their noteworthy incentive with the remarks about the hypothesis testing.

The outcomes of the partial least square structural equation modelling are shown in Table 7. It confirmed that the outcomes with regression path coefficient, t-statistics, probability values (P values) and the remarks related to the hypothesis testing.

Table 6: Results of HTMT ratio of correlations

	ENS	EMA	MAC	ECP	ENP
ENS					
EMA	0.704				
MAC	0.326	0.613			
ECP	0.492	0.530	0.622		
ENP	0.339	0.597	0.564	0.589	

Source: Authors estimation

Table 7: Results of path coefficients

Hypothesized path	Path coefficient	CR	P value	Remarks
ECP←ENS	0.246	4.305	0.000	Supported
ENP←ENS	0.215	3.497	0.000	Supported
ECP←EMA	0.302	3.994	0.000	Supported
ENP←EMA	0.332	4.030	0.000	Supported
ECP←MAC	0.291	5.456	0.000	Supported
ENP←MAC	0.302	5.212	0.000	Supported

Level of significance (5% i.e., 0.050). Source: Authors' estimation

Generally, the outcome confirm that all selected variables have a positive and significant impact on economic and ENP in the SMEs in Indonesia. Moreover, the outcomes of the partial least squares structural equation modeling (PLS-SEM) confirm that ECP ($\beta = 0.246$, $P < 0.000$) and ENP ($\beta = 0.215$, $P < 0.000$) have significantly and positively impacted by ENS hence affirming H_1 and H_2 . The outcomes of partial least square structural equation modelling also indicate that economic ($\beta = 0.311$, $P < 0.302$) and ENP ($\beta = 0.332$, $P < 0.000$) have also positively and significantly impacted by the EMA, therefore, confirming H_3 and H_4 . Finally, the results of PLS-SEM also specified that ECP ($\beta = 0.291$, $P < 0.000$) and ENP ($\beta = 0.302$, $P < 0.000$) have significantly and positively affected by MAC henceforth supporting H_5 and H_6 . Technically speaking, the results of partial least square confirm that the all factors, i.e. ENS, EMA and MAC are the positive and significant contributor to enhance the economic and ENP of SMEs in Indonesia.

5. CONCLUSION AND DISCUSSION

Nowadays, carbon and other ozone harming emanations are one of the fundamental drivers of this overshoot. In addition, industries have been the principle producers of ozone harming substances, in the past as well as in the present. In order to curtail negative ecological effects including carbon emanations, environmental management has proved to be beneficial. In the field of accounting, EMA has been regarded as the successful notion for reducing ecological burdens in the form of energy dependence and carbon footprints. In similar context, several features of EMA in the form of material flow cost, sustainability balanced score card, and ecological control (eco-control) are found useful in identifying firm's effects on the ecological conditions. Moreover, organization's enhanced environmental consciousness cannot be successful in reaching the objective of sustainability without management support. In this regard, MAC for ecological improvement is significant to achieve productive organizational growth. In many ecological processes, organizations have to face with difficult tradeoff between monetary benefits and cost increments. Under such condition, the MAC is necessary to

strengthen organizational ecologically driven objectives over financial gains. However, many studies believed that firm's efficient environmental policies not only confine the ability to improve ENP but also boost organizational ECP.

In the light of above discussion, the current examination aims to investigate the relationship between accounting, management and environment in realizing firm performance. In doing so, the current examination opted to inspect the critical relationship of EMA, ENS and MAC in driving firm performance. Given the concerns within the literature that environmental processing within organization enhance financial costs, the authors of the study are motivated to analyze the impact of the variables on both environmental and ECP of SMEs in Indonesia. We apply novel partial least square structural equation modelling by collected the data from 317 respondents of different small and medium size enterprises of Indonesia. The results of SEM confirm that ECP and ENP have significantly and positively impacted by ENS. The outcomes of partial least square structural equation modelling also indicate that economic and ENP has also positively and significantly impacted by the EMA. Finally, the results of PLS-SEM also specified that ECP and ENP have significantly and positively affected by MAC. In conclusion, the current study contributes that the adoption of good ENS and effective MAC will eventually help the SMEs to improve their ECP as well as ENP.

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