

A Research on the Impact of Top Management Commitment and Training on Benefits of Environmental Management System Application in Different Enterprises

Thi Lien Huong Nguyen^{1*} Nguyen Ngoc Linh Ha² Thi Thanh Hoa Nghiem¹
Ngoc Anh Pham³ Thi Quyen Toan¹

1. Faculty of Business Management, National Economics University, 207 Giai Phong, Hanoi, Vietnam
2. Faculty of Real Estate & Resources Economics, National Economics University, 207 Giai Phong, Hanoi, Vietnam
3. School of Banking and Finance, National Economics University, 207 Giai Phong, Hanoi, Vietnam

Abstract

This paper aims to investigate the impact of 2 factors in the internal motive (top management commitment and employee training) on three dimensions of benefits (environmental, economic, and social) in enterprises that apply environmental management systems (EMS). The survey collected answers from 258 top-tier and quality managers of ISO 14001 certified enterprises in Vietnam. Research results show that top management commitment impacts economic, social, and environmental benefits. Meanwhile, training only influences environmental and social but not economic benefits. Furthermore, this paper also finds evidence that environmental benefits have impacts on economic and social benefits in the research context of Vietnam.

Keywords: ISO 14001, environmental management systems (EMS), environmental benefits, economic benefits, social benefits

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1. Introduction

In the 1970s, initial discussions about sustainable development began to emerge (Mazzi et al., 2016) especially as our living environment started to deteriorate over time after industrialization took place. Nowadays, sustainable development and environmental preservation in specific areas have become many enterprises' prioritized targets besides profitability. According to Krajnc and Glavic (2003), there is a lot to be changed in industrial processes including the type and number of resources used, waste disposal, emission control, product design, and the like to uphold environmental requirements. An environmental management system (EMS) was issued in 1996 to assist enterprises in building policies and guiding solutions to enhance environmental efficiency. ISO 14001 has gained increased popularity ever since. According to the 2020 ISO organization survey, there were 348,218 valid ISO 14001 certificates in nearly 180 countries and territories around the world, an increase of 12% compared to that of 2019. These figures show that the benefits of applying ISO 14001 have caught the attention of enterprises and their managers and become an essential part of modern organizational change and development. The urge to understand what motives initiate the application and success of an EMS implementation as well as a deeper insight into which motive impacts what dimension and the strength of their relationships are inevitable. Businesses and managers can focus more efforts on greater influencing motives to achieve desired results by understanding these issues.

Recently, research on the application of ISO 14001 classified two types of motives that influence manager decisions called external and internal motives. External motives mainly involve aspects from the external environment such as customers, competitors, management agencies, non-government organizations, and social groups. Internal motives stem from the enterprises' desire to enhance environmental protection, business brand, and competitiveness through the application of EMS such as ISO 14001 (Castka and Prajogo, 2013; Waxin et al., 2019; Liu et al., 2020). This research focuses on the scope of internal motives only. Literature review shows that there are 4 internal motives that prompt businesses and managers to adopt ISO 14001: i) the desire to improve environmental efficiency (Qi et al., 2012; Murmura et al., 2018; Bravi et al., 2020); ii) the desire to raise employees' awareness about the environment (Poksinska et al., 2003); iii) the desire to improve business brand (Bansal and Bogner, 2002; Sebhatu and Enquist, 2007; Arena et al., 2012); and iv) the desire to improve competitiveness (Iatridis and Kesidou, 2018). The application of ISO 14001 is believed to bring about many benefits to businesses such as reducing the use of raw materials/resources and energy consumption; improving the efficiency of processes; reducing incurred costs and waste disposal; using recoverable resources (Gavronski et al., 2008); raising environmental awareness, improving working conditions for workers (Waxin et al., 2020). Previous studies have investigated the relationship between internal motives and the 3 dimensions of benefits but mostly independently (Boiral and Henri, 2012; Qi et al., 2012; Castka and Prajogo, 2013). This brought up the challenge of understanding the total benefits of what an EMS can do for an organization. Moreover, there are only a very limited number of studies in Vietnam that focus on ISO 14001 and its impact (Nguyen Thanh Do et

al., 2019) and none of them had investigated all three benefits comprehensively. This paper attempts to fill in these gaps by testing the impact of top management commitment and employee training on the social, environmental, and economic benefits of Vietnamese enterprises certified with ISO 14001.

2. Literature review and research hypotheses

2.1. Top management commitment

The adoption of the Environmental Management System is a long-term program that requires top managers' commitment to participate and support comprehensively. Although the influences of managers and related impacts have been studied for a long time, the term Top management commitment officially appeared around the early 90s. During this period, top management commitment is often related to emotional factors, intentions, beliefs, and attitudes in the pursuit of the organization's goals (Bagozzi, 1992). After this period, the concept of top management commitment is flexibly adapted to each research context such as quality (Kanji, 2001; Ahmed et al., 2021), innovation (Llorén et al., 2004; Rodríguez et al., 2008), or customer perception (Sakthivel, 2007) ... Despite the change of the field, top management commitment usually mentions the full participation and support of top managers for the change or need in the underlying research context.

Table 1. The definition of top manager commitment

Year	Author	Definition
1992	Bagozzi	The top management commitment is the commitment to the affection, intentions, beliefs, and attitudes of the top manager in the pursuit of the organization's goals.
2001	Kanji	The top management's commitment to quality is the fundamental driving force to achieving improvement and excellence in quality in the business.
2004	Llorens et al.	The top manager commitment means that top managers will be involved in the whole development process and fully support innovation activities.
2007	Sakthivel	The commitment of top managers is considered as the right leadership style for addressing the needs and feelings of customers.
2008	Rodríguez et al.	The commitment of senior managers is that managers are involved in the whole development process and fully support innovation activities.
2021	Ahmed et al.	The commitment of senior managers is the participation of the top leader in efforts to improve the quality of the product.

Previous research has shown that the role of senior managers is very important, especially in planning, allocating resources, and establishing policies, and strategies. Senior managers' support and commitment are the keys to the success of any system implementation including quality management systems in general (Jun et al., 2006) and ISO 14001 in specific. Such commitment and support help to facilitate change, and direct orientation in planning and managing ISO initiatives (Chin et al., 1999; Nee, 2011). Therefore, top management commitment is expected to have a direct positive impact on the benefits of applying environmental management system through the provision of necessary orientation and resources. Based on the above findings, this paper proposes the following hypotheses:

H1a: Top management commitment has a positive impact on the economic benefits of the company that applies ISO 14001.

H1b: Top management commitment has a positive impact on the environmental benefits of the company that applies ISO 14001.

H1c: Top management commitment has a positive impact on the social benefits of companies that applies ISO 14001.

2.2. Employee training

To apply the ISO 14001 environment management system effectively, employee needs to have an understanding of the required knowledge and skills to be able to build and deploy it. Training will provide the necessary conditions to facilitate such requirements. Training has been under the spotlight for a long time in many different research fields thanks to its important role in shaping up the company workforce and preparing them to be ready for this ever-changing business environment. Scholars had come up with many different definitions of this popular term in the last century. More recently, however, with the shift of management emphasis to customer focus, training in the 1990s was conceptualized around the pathway to improving customer service quality and other matters of concern including performance, satisfaction, and commitment (Roehl and Swerdlow, 1999).

Table 2. Employee training definition

Year	Author	Definition
1999	Roehl and Swerdlow	Training is seen as the pathway to customer service quality, the most consistent in job performance and satisfaction, as well as the commitment to the organization.
2000 2007	Patrick Schmidt	Training is the systematic development of knowledge, skills, and expertise that a person needs to effectively perform a given task or certain job.
2001	Obisi	Training is a process through which the skills, talents, and knowledge of an employee are enhanced and increased.
2006 2012	Armstrong Daoanis	Training is behavior change through experience, transferring skills and knowledge from those who have them to those who do not.
2011	Brown and Sitzmann	Training is defined as an attempt to help employees acquire knowledge and skills relevant to the job.
2018	Noe and Kodwani	Training refers to a company's planned effort to facilitate the learning of competencies, knowledge, skills, and behaviors relate employee's job.

In the later years of the 2000s, with the rise of innovation and knowledge sharing importance, training was revolving around the development of knowledge, skills, talents, and expertise that an employee needs to perform a certain job effectively (Patrick, 2007; Obisi, 2001; Armstrong, 2006; Schmidt, 2007). The most recent decade has seen scholars focus more on the process of knowledge movement through acquiring, transferring, behavior change in sharing knowledge, experiences, skills, competencies, and job behavior of employees (Brown and Sitzmann, 2011; Daoanis, 2012; Noe and Kodwani, 2018). Despite changes in the focus of the training concept, its important role in an organization was never under dispute throughout the years.

Literature review shows that training has been found to have an impact on companies' financial performance (Miron and McClelland, 1979; Paul and Anantharaman, 2003; Singh et al., 2019; Agyabeng-Mensah et al., 2020) and other economic benefits such as reduction in waste treatment cost, savings from violation fines... (Yong et al., 2019; Mousa and Othman, 2019). Previous studies also confirm the impact of training on environmental benefits (Vidal-Salazar et al., 2012; Guerci et al., 2016; Masri and Jaaron, 2017; Pham et al, 2020) and on different aspects of social benefits such as improving corporate images with customer and community (Bon et al., 2018; Acquah et al., 2020) or improvement of commitment with ethic and health issues (Mousa and Othman, 2019). Training allows employees to expand their knowledge and skills to participate in more effective teamwork and achieve personal development and growth (Jun et al., 2006) and is also an important factor in implementing an environmental management system, training helps to change attitudes and behaviors thereby raising employees' awareness of environmental issues (Sammalisto and Brorson, 2008). Through training, employees become aware of ISO 14001 program's meaning and importance and realize the role they will play in implementing it. This, in turn, enables them to participate in ISO 14001 deployment and promote its success. Therefore, this study expects training to have a positive impact on economic, environmental, and social benefits:

H2a: Employee training has a positive impact on the economic benefits of the company that applies ISO 14001.

H2b: Employee training has a positive impact on the environmental benefits of the company that applies ISO 14001.

H2c: Employee training has a positive impact on the social benefits of companies that applies ISO 14001.

2.3. Research model

In literature, the concepts of HMS were associated with a myriad of technical measures. McFarlane (1995) Other than inducing the influences from the motive factors, the benefit dimensions also impact each other. Literature review shows that previous studies had attempted to examine the relationship between environmental benefits with economic benefits in the measure of financial and stock market performance (Bennett et al., 1999; Day, 1998; Wagner, 2000, 2001; Jan et al., 2012) and found a positive correlation from environmental benefits to performance indicators of companies. In addition, the improvement in environmental benefits will in turn improve different aspects of social well-being (Daily et al., 2012; Zaid et al., 2018; Longoni et al., 2018; Yong et al., 2019).

In the later years of the 2000s, with the rise of innovation and knowledge sharing importance, training was revolving around the development of knowledge, skills, talents, and expertise that an employee needs to perform a certain job effectively (Patrick, 2007; Obisi, 2001; Armstrong, 2006; Schmidt, 2007). The most recent decade has seen scholars focus more on the process of knowledge movement through acquiring, transferring, behavior change in sharing knowledge, experiences, skills, competencies, and job behavior of employees (Brown and Sitzmann, 2011; Daoanis, 2012; Noe and Kodwani, 2018). Despite changes in the focus of the training concept, its important role in an organization was never under dispute throughout the years.

In short, the literature review shows that when enterprises want to apply an environmental management system to improve operating efficiency, as well as under pressure from stakeholders, enterprises will not apply

the environmental management system in a coping way to increase productivity, improve the environment, increase reputation leading to increased sales and profits. In addition, achieving environmental benefits will lead to enterprises achieving economic benefits such as cost savings, increased sales, and social benefits such as an improved work environment, employees' awareness, and recognition of environmental responsibility are enhanced. Thus, this paper proposes to examine the following hypotheses:

H3: Environmental benefits have a positive impact on the economic benefits of the company that applies ISO 14001.

H4: Environmental benefits have a positive impact on the social benefits of companies that applies ISO 14001.

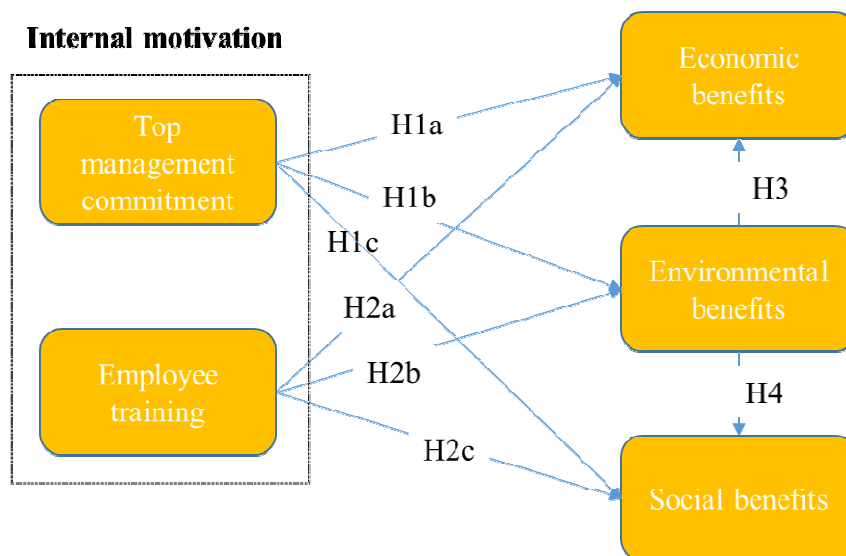


Figure 1: Research model

3. Research methods

The chosen research sample is ISO 14001 certified enterprises in Vietnam. The certified company list was extracted from a report from the Ministry of Industry and Commerce. The team contacted these enterprises with an introduction letter from the Ministry. There were 600 surveys sent via postal mail and 301 returned answers (50.17%). After scanning, the incomplete responses were removed, and the remaining 258 valid answers (43%) were input for data analysis. Since the managers are Vietnamese, the questionnaire was translated to Vietnamese from the English version using a qualified notary service and sent to a pilot sample of 30 managers for comments. Several wording issues were fixed to ensure the questionnaire is user-friendly. The final Vietnamese version was translated back into English using the same method to compare for any loss in translation.

Table 3: Origin of scales

Variable name	Source
Top management commitment	Wee and Quazi (2005)
Employee training	Wee and Quazi (2005)
Environmental benefits	Maletic et al (2015)
Economic benefits	Maletic et al (2015)
Social benefits	Maletic et al (2015)

The questionnaire consists of 2 parts: i) General information where companies will provide information regarding their business sector, size, and the time they are qualified with ISO 14001 to date; and ii) Statements related to 2 independent variables (top management commitment, employee training) and 3 dependent variables (environmental benefits, economic benefits, social benefits). Data collected were analyzed using SPSS and AMOS including reliability testing, discriminant & convergent validity (EFA, CFA), and hypotheses testing using SEM.

4. Research results

Regarding the ISO14001 certified time, most participating enterprises (48.8%) were less than 5 years certified. The second most populated rank is the 5 to 10 years of certification with 97 enterprises or 37.3% of the total sample. There are not many enterprises in Vietnam with more than 10 years of ISO 14001 certification participated in this study, only 34 enterprises or a total of 13.1% participated. Given the fact that ISO 14001 has only been applied in Vietnam since 1998, it is reasonable that the number of enterprises with over 10 years of certification is still limited.

Regarding the size of enterprises in the sample, the highest weight belongs to enterprises with the size of 100 to 1000 employees with 45.8% participants, followed closely by the small enterprises with less than 100 employees with 42.3% participants. The other 2 ranges of bigger size enterprises participated in a much more modest volume. To be more specific, enterprises with 1000 to 5000 employees account for 10% while the big one with over 5000 employees accounts for only 1.2%. This is in line with the characteristics of the Vietnamese economy where small and medium enterprises (SMEs) still account for a large percentage of the number of companies. The survey has been able to cover a wide variety of business sectors in its sample. The sector with a significantly higher number of participants is chemistry with 82 enterprises, accounting for 31.5%. The followed sector is mechanics with 19.6% then electrical and electronic with 16.2%. There are no other sectors that accounted for more than 10% of the total participants. This shows that the survey has good coverage of representatives from different industries.

Table 4: Sample characteristics

Sample characteristics	Frequency	Weighted (%)
ISO 14001 certified time	258	100
Less than 5 years	127	48.8
From 5 to 10 years	97	37.3
More than 10 years	34	13.1
Size	258	100
Less than 100 employees	110	42.3
From 100 to 1000 employees	119	45.8
From 1000 to 5000 employees	26	10.0
More than 5000 employees	3	1.2
Business sector	258	100
Service	8	3.1
Electricity and electronic	42	16.2
Mechanics	51	19.6
Construction	12	4.6
Chemistry	82	31.5
Garment	14	5.4
Food	17	6.5
Other	32	12.3

A reliability test for the scales of the model was conducted using Cronbach's Alpha. Results show that most variables of the model achieved satisfactory benchmarks without the need of rejecting any item. To be specific, Cronbach's Alpha of top management commitment (TMC), employee training (ET), economic benefits (ECB), and social benefits (SB) are all above 0.7, the satisfactory level (Hair et al., 2009). For the environmental benefits variable (ENB), the ENB2 item was removed since its Corrected Item – Total Correlation is less than the required threshold of 0.3 hence the need for elimination of this item from the related scale. Such removal results in a significant improvement of the scale reliability from 0.684 to 0.902. Therefore, after this step, item ENB2 was removed from the next step in the data analysis. EFA results show that the KMO value of this sample is 0.900, which is within the satisfactory range of $0 < KMO < 1$; Bartlett's sig. is $0.000 < 0.05$ with Eigenvalue, total variances explained and factor loading in Pattern Matrix all achieved satisfactory level (Hair et al., 2009) which indicates that the variables fulfill discriminant and convergent validity.

Confirmatory factor analysis (CFA) was performed to check the suitability of the model with the research data. CFA results show that model fit is satisfactory with Chi-square/df of $1.551 < 2$; GFI = $0.911 > 0.9$; CFI = $0.974 > 0.95$; RMSEA is $0.046 < 0.06$ (Hair et al., 2009) and TLI = $0.969 > 0.9$, PCLOSE is $0.709 > 0.05$ (Hu & Bentler, 1999). The research model and its variables are now qualified to test for SEM.

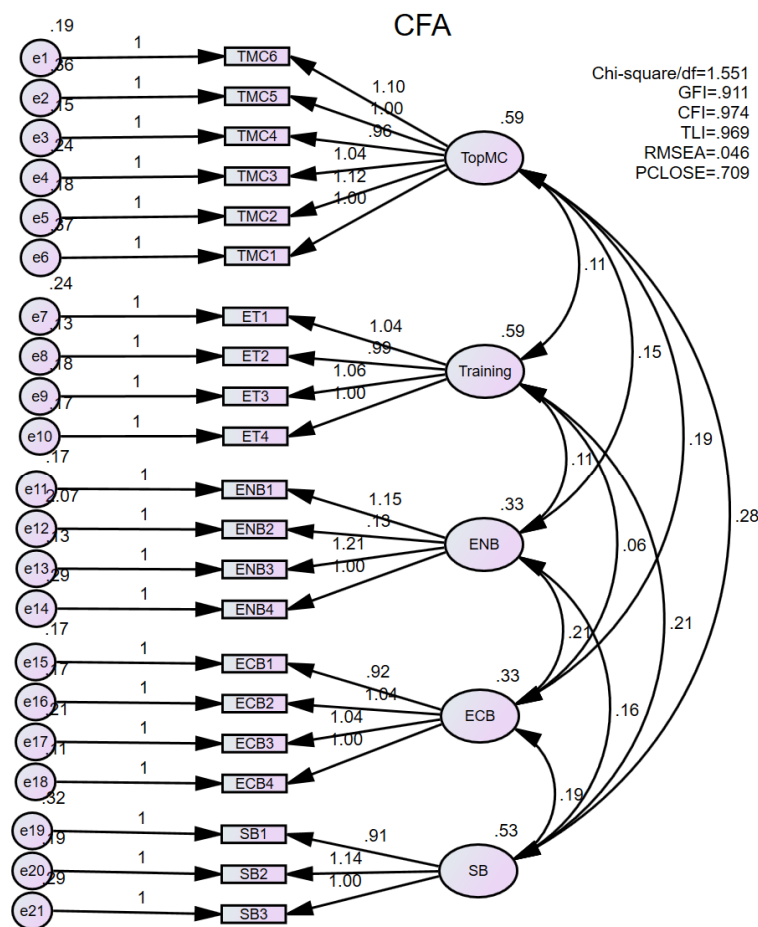


Figure 2: Confirmatory factor analysis (CFA) results

SEM results show a good model fit with Chi-square/df of 1.582 < 2; GFI = 0.909 > 0.9; CFI = 0.972 > 0.95; RMSEA is 0.048 < 0.06 (Hair et al., 2009); TLI = 0.968 > 0.9 and PCLOSE of 0.639 > 0.05 (Hu & Bentler, 1999). Results from Regression Weights confirm all but the impact of Training on Economic Benefits where there is no evidence to show a statistically significant effect as the p-value of the underlying relationship is 0.444 > 0.05. The remaining relationships are all statistically significant (sig < 0.05). In short, hypothesis H2a is rejected and the remaining hypotheses (H1a, H1b, H1c, H2b, H2c, H3, H4) are all supported.

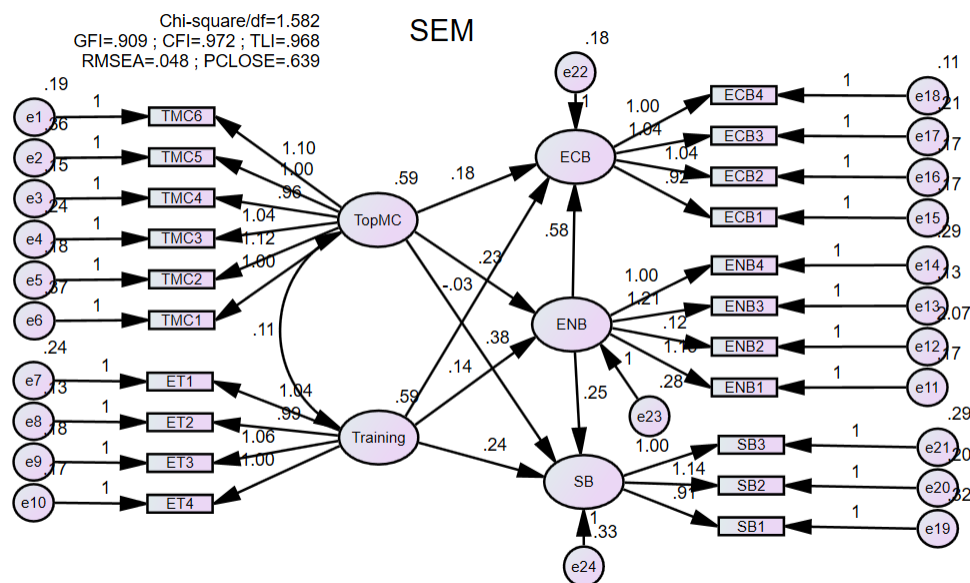


Figure 3: Results of hypotheses testing using structural equation model (SEM)

Results from Standardized Regression Weights show that: i) for Environmental benefits, Top management commitment (0.307) has a stronger positive influence than Training (0.187); ii) for Economic benefits, only Top management commitment has a positive influence (0.245); iii) for Social benefits, Top management commitment (0.396) has a stronger positive influence than Training (0.250) and iv) Environmental benefits have a significant positive influence on both remaining benefits in which the effect on Economic benefits (0.574) is more than on Social benefits (0.196).

Finally, SEM Squared Multiple Correlations confirm that the model can explain 47.1% of Economic benefits' changes, 37% of Social benefits' changes, and 15% of Environmental benefits' changes. Thus, there are still other impact factors that were not identified and included in this research.

5. Conclusion

Research result implies that top management commitment affects all three dimensions of environmental, economic, and social benefits. More specifically, top management's commitment to impact on social benefits is strongest ($\beta=0.396$), followed by environmental benefits ($\beta=0.307$) and finally economic benefits ($\beta=0.245$). This result further confirms the essential role of top managers and their commitment to determining the success of ISO 14001 implementation (Chin et al., 1999; Sambasivan & Fei, 2008; Cassells et al., 2011). In addition, training also has a significant effect on environmental benefits and social benefits though no evidence has been found that this factor impacts economic benefits. This result is also in line with previous studies where training plays a crucial role in the environmental management system implementation and success because of the benefits it brings (Wee and Quazi, 2005; Sammalisto and Brorson, 2008). However, employee training in the context of Vietnamese enterprises does not affect economic benefits yet. The reason for this may come from the nature of training which is a long-term investment. Training is usually done to change people's mindsets and perceptions, update new knowledge, or have similar aims. However, it takes time for these changes to make an impact and then, in turn, lead to economic benefits. This result might change in the future when the accumulated time of change is sufficient to make an impact.

The research results encourage ISO 14001 certified businesses to focus their effort on strengthening top management commitment to promoting the achievement of economic, social, and environmental benefits. In this research and many others, top management commitment is usually the most influencing factor in promoting enterprises' overall initiatives including environmental and sustainable development. For this reason, top management in companies needs to focus on building EMS supportive policies, setting out clear environmental goals, putting environmental requirements into business activities, and allocating necessary resources for EMS implementation (Zutshi and Sohal, 2004; Wee and Quazi, 2005). Moreover, management also needs to take measures to promote the awareness and commitment to environmental matters and EMS compliance such as increasing training and internal communication, building environmental focus culture via frequent workshops and sharing sessions like sharing success stories of enterprises with EMS, sharing case studies of consequences from enterprises violating environmental management for lesson-learned purposes.

There are several areas that future studies of the same topic can focus on to improve. Firstly, top management commitment and training are only able to explain part of the changes in economic, environmental, and social benefits thus there will be other impact factors that were not included in this study and should be explored in the future. Apart from other internal motives factors such as green product design, employee involvement, teamwork, and green supply chain management..., future studies can also explore external motives factors. Secondly, research approaches and results have been rather mixed with economic benefits' related relationships. On one hand, there are not many previous papers that conducted a comprehensive study of all three dimensions of benefits to identify and distinguish the measurement of each dimension which limited the results that this paper can refer to. Most previous papers that related to the economic impacts referred most to the financial performance or stock market performance as general items to measure with scattered scales that different from study to study. On the other hand, as most practices and policies within an organization are built towards the improvement of financial performance, it is challenging to differentiate and isolate the impact of ISO 14001 implementation via different motives on the economic benefits using financial performance measurement. This calls for future studies to develop a better-adapted scale with more specific and related items to measure economic benefits in the context of studying ISO 14001's impact.

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Appendix1: Questionnaire items

Top management commitment

- TMC1 Setting an environmental vision or corporate policy.
- TMC2 An overall strategy was established to guide the company's effort to achieve the vision.
- TMC3 Strategic planning by top-level management incorporates environmental inputs.
- TMC4 Environmental issues are being integrated into critical business functions and operations.
- TMC5 Participation of top-level managers in environmental projects.
- TMC6 Sufficient resources allocated to implement certain environmental projects

Employee training

- ET1 Employees are to be trained in skills that are required to fulfill their environmental responsibilities and achieve their environmental goals.
- ET2 Educate employees to increase their environmental awareness.
- ET3 Environmental training scope and content should also be regularly reviewed and improved.
- ET4 Resources must also be allocated for training.

Environmental benefits

- ENB1 The efficiency of the consumption of raw materials has improved during the last 3 years
- ENB2 The resource consumption (thermal energy, electricity, water) has decreased (per unit of income, per unit of production, ...) during the last 3 years
- ENB3 The percentage of recycled materials has increased during the last 3 years
- ENB4 The waste ratio (kg per unit of product, kg per employee per year...) has decreased during the last 3 years

Economic benefits

- ECB1 Return on investment (ROI) has increased above industry average during the last 3 years
- ECB2 Sales growth has increased above industry average during the last 3 years
- ECB3 Profit growth rate has increased above industry average during the last 3 years

ECB4 Market share has increased during the last 3 years

Social benefits

SB1 The turnover ratio has decreased during the last 3 years

SB2 The employees' satisfaction has increased during the last 3 years

SB3 The employees' motivation has increased during the last 3 years