

# Does ISO 14001 Adoption Impact On Company's Performance in Indonesia?

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## Abstract

Stakeholder pressure and winning in competition trigger companies to adopt environmental management systems (EMS). Nevertheless, environmental management adoption does not always have positive impact on organizational performance. Previous studies indicated that the relationship between environmental management systems and financial performance still vague. This study investigates the indirect impact of environmental management systems on financial performance through environmental performance as a mediator. Data were collected from government institutions and Indonesia Stock Exchange. PLS-SEM was utilized in analyzing the data. The findings suggest that direct and indirect effects of EMS adoption on financial performance are insignificant. However, the study shows that environmental management system significantly affects environmental performance and environmental performance impact on financial performance significantly. The conclusion implies, implementing an environmental management system lead to better environmental performance and higher financial performance. More incentive should be provided to attract more company involved in environmental management best practices. The future study considers company's maturity in adopting EMS, do different test for beyond compliance and compliance companies, and its impact on environmental performance and financial performance, uses market-based indicators to assess financial performance as well.

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## 1. Introduction

The increasing public attention toward environmental issues encourages businessmen to integrate these issues in their business practices. Business activities are considered to have a lot of negative impacts on the natural environment that potentially threaten business continuity. Pollution arising from business activities can pose a threat to boycotts from the government and society (Sagarin et al., 2009) and decrease the company reputation (Miles, Covin, Miles, & Cov, 2000). The massive exploitation of natural resources also potentially reduces the supply of production factors such as fossil fuels. Many business practitioners adopt an environmental management system as a solution in mitigating environmental problems. The

International Standards Organization (ISO) showed companies' interest in adopting Environmental Management Systems (EMS) continues to grow. In 2013, there were more than 320,000 companies or facilities that adopted the environmental management system, from the total number of EMS adopters, which adopted ISO as many as 301,647, in 170 countries worldwide (Phan & Baird, 2015). Companies' initiative in adopting environmental management systems is driven by different motivations, such as competitive advantage, commercial, ethical and relational (González-Benito & González-Benito, 2005; Rino & Salvador, 2017). The different motivation in adopting an environmental management system result in different impact on financial performance and environmental performance.

The association between EMS adoption and company performance has been widely investigated. However, the study showed mixed result. It was about 55 percent showed environmental management systems adoption resulted in positive impact on financial performance. While 15 percent indicated negative results, and the remaining 30 percent concluded there was no relationship (Horváthová, 2010). The inconsistent result caused by, first, studies carried out on companies that adopt different type of EMS. It is known that there two types of environmental management systems (EMS), formal or certified EMS and informal or uncertified EMS. The example of formal EMS is Eco-Management and Audit Scheme (EMAS) and ISO 14001, and both systems are different (Testa et al., 2014a). The company that follows formal EMS should comply with standard that published by the International Standard Organization or other institution, and regularly the institution hold audit to convince that the organization complies with standard. In contrast, Informal EMS designed by company's initiative and there is no audit by independent party. Formal EMS often associated with proactive environmental management strategy. Roome (1992) categorized EMS as a strategy. He proposed three company's categories are associated with environmental strategy; non-compliance, compliance and compliance-plus. Non-compliance companies tend to choose passive strategy, they ignore environmental issues. The compliance company adopt reactive strategy, they do some environmental actions as a reaction of stakeholder's pressures especially government pressure. Reactive environmental management focus on air pollution control, water pollution control and toxic waste management. Whereas, compliance-plus companies adopt proactive environmental management that has boarder scope than reactive strategy. Its practices emphasized on pollution prevention through reduction pollution at the source. Adoption different types of EMS produce different impact on environmental performance and financial performance.

Second, previous studies used different types of environmental performance indicators, the amount of waste produced (Iwata & Okada, 2011; J. Sarkis & Dijkshoorn, 2007; Sharma & Henriques, 2005) waste management (José F. Molina-Azorín, Tarí, Claver-Cortés, & López-Gamero, 2009), energy reduction, water reduction, waste reduction, reduction in packaging, recycling of materials or reuse and toxic waste pollution emissions (De Burgos-Jiménez, Vázquez-Brust, Plaza-Úbeda, & Dijkshoorn, 2013), electricity index (Giljum, Burger, Hinterberger, Lutter, & Bruckner, 2011) total material requirements (Baboulet & Lenzen, 2010), greenhouse gas emissions (Psaraftis & Kontovas, 2010), and release of toxic waste (Patten, 2002).

Third, various financial performance indicators used in the different study, accounting-based measures (Iwata & Okada, 2011; M. G. Yang, Hong, & Modi, 2011),

market-based measures (Dowell, Hart, & Yeung, 2000; Luo & Bhattacharya, 2006) and cost approaches (Christmann, 1999). Fourth, previous study demonstrated different data collection methods, such as survey (Comoglio & Botta, 2012; Franchetti, 2011; Melnyk, Sroufe, & Calantone, 2009), in depth interview (Gasbarro, Rizzi, & Frey, 2013; Jose F. Molina-Azorín, Tarí, Pereira-Moliner, López-Gamero, & Pertusa-Ortega, 2015), and documentation (Iwata & Okada, 2011; Nishitani, Kaneko, Fujii, & Komatsu, 2012). Fifth, one revealed that unclear association between two variables due to both variables could not be tested directly, mediator variables or moderators are needed to test the relationship between the two variables (Henri & Journeault, 2008).

This study directed to examine the indirect influence of the environmental management system on financial performance through environmental performance as mediator variable. There are four conditions that should be fulfilled in testing mediator variable, 1) the independent variable should affect dependent variable significantly, 2) the independent variable significantly influence mediator variable, 3) the mediator variable significantly affect dependent variable, 4) the effect of the independent variable on the dependent variable must diminish after controlling for the effects of the mediator (Baron & Kenny, 1986; Joseph Sarkis, Gonzalez-Torre, & Adenso-Diaz, 2010) Many studies showed that EMS adoption significantly impact on financial performance (Epstein, 2009; Henri & Journeault, 2008; Melnyk, Sroufe, & Calantone, 2003; Jose F. Molina-Azorín et al., 2015). The significant evidence impact of environmental management system on environmental performance revealed by Gasbarro et al., (2013); King, Lenox, & Terlaak (2005); José F. Molina-Azorín et al., (2009); Nishitani et al., 2012; Potoski & Prakash (2005). De Burgos-Jiménez, Vázquez-Brust, Plaza-Úbeda, & Dijkshoorn (2013); Ferrón-Vílchez (2016); Montabon, Sroufe, & Narasimhan (2007) confirmed environmental performance significantly affect financial performance.

The study will be conducted in Indonesia. More than a decade, the Indonesia government released the company compliance assessment program in environmental management (PROPER) that directed to increase the company's participation in minimizing adverse environmental impact. Data published by the government showed companies' involvement in this program tend to increase every year. According to The Minister of Environment Regulation No.3/2014, the company's participation in environmental management is classified into four categories, beyond compliance, compliance, less compliance and not compliance. PROPER reporting (2016-2017) showed 70% companies included in compliance company, that doing environmental management at the minimum standard, and 23% companies include in beyond compliance companies and the rest, 7% included in the last two categories. Referring

to the data, the question, do companies participation in the environmental management result in positive impact on environmental performance and financial performance.

## 2. Literature Review

The classical economists claimed that the company's concern on environmental issues will result in losses (Marc Orlitzky, Frank L. Schmidt, 2003). Environmental commitment needs large investment to be implemented. Investment both end-of-pipe and prevention pollution technologies potentially reduce the company's profit (Joseph Sarkis & Cordeiro, 2001). Economists argued that in running the business, companies heavy rely on capital from the shareholders, therefore, the company's responsibility should be focused on maximizing profits for shareholders. They also argued that companies are not individuals who can be given responsibility to carry out environmental responsibilities. On the other hand, stakeholder theory reveals that the company's success determined by manager capability in creating the relationships with stakeholders (Elkington 1997), the provider of production factors. Anton & Khanna (2002); Delmas & Toffel (2008); Joseph Sarkis et al., (2010) confirmed that stakeholder pressures be a major reason why company doing environmental management practices, particularly government pressures. However, Hart (1995) argued that environmental management adoption forced by regulation resulted in low performance and the insignificant impact on company competitiveness, but it refuted by Arimura, Darnall, Ganguli, & Katayama (2016); Porter & Linde (1995); Joseph Sarkis et al., (2010). Environmental regulation allowed company to use technologies that resulting cost efficiency such as air filter technology. Study by Joseph Sarkis & Cordeiro (2001) indicate that utilizing prevention pollution technologies produced large negative impact on financial performance than end-of-pipe technologies. Investment on prevention pollution technologies are higher than investment in end-of-pipe technologies, and the impact of investment could not be seen in the short-term performance. The company's initiative in adopting formal environmental management systems is associated with beyond compliance on regulation that confirmed has positively impact on environmental performance and financial performance (Arimura et al., 2016; Darnall, Henriques, & Sadorsky, 2008; Franchetti, 2011; Testa et al., 2014b). Adopting ISO 14001 certificate generates some benefits such as the strong reputation that lead to improved external party trust (Martín-de Castro, Amores-Salvadó, & Navas-López, 2016; Miles et al., 2000) claimed that strong reputation impact on the increasing sales that produced higher profit. King et al., (2005); Macdonald, 2005; Schmidt-bleek, Lardereel, & Basile (2002) also revealed the formal EMS provide systematic procedures for planning, implementing, monitoring, evaluating and

taking corrective action in mitigating environmental issues than informal EMS. ISO 14001 adoption lead to sustainable environmental performance. Delmas (2001); S. Hart (1995) also argued that ISO 14001 as a source of competitive advantages, it facilitates company to cut costs through reduced use of materials, energy and water, process and product more environmentally friendly and waste management which carried out through recycle, reuse and reduce process of non-hazardous and toxic waste and hazardous and toxic waste (Ghissetti & Rennings, 2014; Klassen & Whybark, 1999; Tan, Habibullah, Tan, & Choon, 2017)

Company success in reducing environmental problems showed on environmental performance improvement that proxied by energy reduction, water reduction, waste reduction, reduction in packaging, recycling of materials or reuse and toxic waste pollution emissions (De Burgos-Jiménez et al., 2013). The impact of environmental performance on financial performance observed by Ferrón-Vílchez (2016); Meng, Zeng, Shi, Qi, & Zhang (2014). Some finding (S. L. Hart & Ahuja, 1996; Montabon, Sroufe, & Narasimhan, 2007b; Tan et al., 2017) indicated that the reduced of water, energy and materials consumptions produced cost savings, reduction in waste and packaging result in lower cost for handling waste and increased in the salable recycle product of waste management generate additional revenue. Morrow & Rondinelli (2002) implied that environmental practices focus on cost production efficiency would impact on financial performance. The other study mentioned, financial performance improvement generated by cost efficiency associated with loss of environmental risks that resulted from comply with environmental regulation, better employees' health of reduction in air and water pollution, and higher reputation generated from stakeholder trust improvement (Khanna & Anton, 2001; Koehn, Asce, & Datta, 2004; Miles et al., 2000; Potoski & Prakash, 2013).

In this study, environmental management system adoption proxied by the possessing of ISO 14001 certificate. Based on possessing certificate, the companies classified into group, the company with ISO 14001 certificate is given code 1, the company without certificate will be marked 0. Environmental performance evaluated based on compliance rating, beyond compliance company is coded 1, 0 for compliance company. Referring to the Minister of Environment Regulation No.3/2014 article 6, the performance of beyond compliance company evaluated based on succeeded in controlling, water pollution, air pollution, hazardous waste management, reducing in materials, water and energy, reducing and utilizing hazardous and toxic waste, and non-hazardous and toxic waste, reducing greenhouse gas emissions, protect biodiversity, and empower communities. Whereas, article 5 mentions that compliance company performance assessed by water pollution reduction, air pollution reduction and hazardous

and toxic management waste. Financial performance used to describe the company's success in carrying out its business activities. Organizational performance measured by profitability and growth (Darnall et al., 2008). This study applies return on sales (accounting-based approach) in evaluating the company's ability in gaining profit from sales. Once mentioned, strong reputation resulted of EMS adoption allows company to generate more sales from core product and by-product resulted from recycle activity. Potential profit also can be obtained from cost savings of less materials, energy and water consumption and cost efficiency from waste and pollution handling cost.

### 3. Research Method

Population of the study are all manufacturing companies that are listed on the Indonesia Stock Exchange and State-Owned Enterprises. The sample was selected using a purposive sampling method with some criteria namely; go public manufacturing companies and state-owned enterprises that issued annual reports and financial reports in 2016, the company has adopted an environmental management system and followed an environmental compliance assessment program (PROPER). Manufacturing companies are selected as a unit of analysis because these companies have a large impact on the environment. Secondary data is obtained through the website, [www.idx.co.id](http://www.idx.co.id), [www.menlh.go.id](http://www.menlh.go.id) and the company's website. Data used in the form of annual reports, financial reports and PROPER reports. The data obtained were analyzed using Warp-PLS version 6.0.

Based on data presented on the company's annual report in 2016, 64 companies are chosen as the research sample, companies that have ISO 14001 certification were 46 companies or 72%, the remaining 18 companies have not been certified or they involved in the informal environmental management system. Referring to the company's environmental performance (PROPER), 49 companies or 77% include in the compliance company category, 15 companies are categorized as beyond compliance. According to the data, it can be implied that most company had complied on regulation in managing their environmental impacts, instead 23% have beyond compliance on regulation. This indicates that all company performance in controlling water, air pollution and greenhouse gas emissions, the implementation of waste management (hazardous and toxic waste) with the principles of reduce, reuse and recycle have been good.

### 4. Results and Discussion

Table 1 implied that the direct effect of the environmental management system (EMS) on environmental performance (EP) is positive and significant. The path coefficient showed (+) 0.264, and p value is  $0.012 < 0.05$ , it implied that relationship both variables significant in 5%. Adjusted  $R^2$  by 5.5% indicates that the influence of EMS on environmental performance is about 5.5%, rest

94.5% affected by other variables outside the model. Environmental policy, planning, implementation, monitoring and evaluation activities which are set to reduce material and energy use, pollution control and waste management are proxy of environmental management practices. The better environmental management implementation the better the environmental performance which reflected by higher in material, water and energy savings, higher pollutants reduction and better performance of waste management. The PROPER report indicates that 77% of the companies are classified as compliance company, that has carried out water pollution control, air pollution control, and hazardous and toxic management waste as required, while 23% beyond compliance company has done the things stipulated in article 5 exceeding those required. In 2016, beyond compliance companies generated non-hazardous and toxic waste reduction by 3,245,604 ton, hazardous and toxic waste reduction by 6,444,846 tones, water efficiency 447,463,288  $m^3$ , energy efficiency 249,808,268 Giga Joule, 75,663,410 tones  $CO_2$ , EQ, and 260 of eco-Innovation. Therefore, it can be concluded that by implementing an environmental management, manufacturing companies can improve its environmental performance. This finding in line with previous study (Arimura et al., 2016; Comoglio & Botta, 2012; Nishitani et al., 2012; Phan & Baird, 2015).

The same conclusion also showed on direct influence of environmental performance on financial performance, path coefficients (+) 0.392 and P values less than 0.001. The better the company's environmental performance the higher the cost can be saved. PROPER report (2016) revealed that energy efficiency, emission reduction, water efficiency, reduced water pollution load and higher reuse and recycle of hazardous and toxic waste and non-hazardous and toxic waste resulting in cost savings of around Rp.53 trillion (3.7 billion USD). The cost savings resulted from beyond compliance companies. It is true that higher cost savings potentially generate lower production cost. Competitive product selling prices resulted from lower production cost (S. L. Hart & Ahuja, 1996; Pagell & Krumwiede, 2004; C. Yang et al., 2019). The lower the selling price the higher the sales generated.

Table 1: The Direct Effect of EMS, Environmental Performance and Financial Performance

Direct Path Coefficient		
	EMS	EP
EP	0.264	
ROS	0.027	0.329
P-Value		
	EMS	EP
EP	0.012	
ROS	0.414	< 0.001
Adjusted $R^2$		

	EP	ROS
EMS	0.055	
EP		0.132

Source: Author 2020

In stark contrast, the impact of environmental management systems on financial performance was insignificant. Although, the relationship of both variables was positive, the path coefficient (+) of 0.027 with a significance level (p value) of 0.414 greater than 0.05. The Adjusted-R<sup>2</sup> 13.2% explains that the influence of the environmental management system and environmental performance on company performance is 13.2%, the remaining 86.8% is influenced by other variables outside the model. The insignificant effect of EMS on financial performance was due to the company's focus in adopting EMS more directed to internal motivation, improving environmental performance than gaining financial benefits. Prajogo, Tang, & Lai (2012) argued that internal motivation, that comprises improving environmental performance, efficiency and control operation, positively associated with environmental benefits that proxied by pollution reduction, diminished energy and material consumptions, and reduced risks of environmental hazards. The motivation is probably triggered by the company's willing to comply on the regulation. The article 8 of The Minister of Environment Regulation No.3/2014 mentions that administrative sanctions and low enforcement will be given on the company that has less compliance and/or non-compliance continued for two years. Regulatory pressures push companies to adopt environmental management that accordance with regulatory mandates (S. Hart, 1995; Levy, 2015). Porter & Linde (1995) also revealed that government pressure triggered competitiveness. By using technology, emissions, pollution and costs that arise due to sanctions, fines and legal problems can be reduced.

ISO 14001 is the process standard that provides guidance in doing environment management, it triggers the differences in practice (Howard-Grenville, Nash, & Coglianese, 2006). The insignificant effect of EMS on financial performance possibly caused by various environmental management practices implemented. The environmental performance showed of 46 companies ISO 14001 adopter, only 15 companies that have beyond compliance performance. It means more than 50% ISO 14001 adopters include in compliance company that doing EMS in limited scope. Therefore, it is plausible if the company's initiative in adopting EMS insignificantly affect financial performance. For example, company A chooses material and energy reduction as priority of environmental management practices, while companies B choose pollution control as a priority. The different goals and targets that will have an impact on the cost item. The first company will get a cost savings from the activities carried out, while the second company may need to spend to buy an air filter tool (to control air pollution) so that

the amount of costs incurred can reduce the income earned. The second company may get benefit from environmental management activities which carried out in the following year through the productivity of employees who freed from air pollution.

Another reason why direct relationship EMS on financial performance insignificant, the study does not identify the company's maturity in adopting an environmental management system. The evidence from the previous study revealed that companies with longer experience are more capable in adopting EMS and very effective in practicing environmental management system, eco-innovations, and environmental legitimacy, then achieve better financial performance (Albertini, 2013; Inoue, Arimura, & Nakano, 2013). The insignificant result probably triggered by maintaining legitimation the company's desire to maintain its legitimation. Ferrón-Vílchez (2016) revealed that many companies adopt environmental management systems to enhance their reputation, the better company's reputation the stronger the legitimacy that associated with external motivation. The legitimacy opens wider opportunities to access. This study uses only one approach in assessing financial performance, it is accounting-based which focused on measuring the company's internal efficiency. While, there is the possibility of companies which adopt environmental management system to strengthen their reputation and attain legitimacy from external stakeholders. According to data, it is showed that the percentage of companies which have ISO 14001 reached 72%, one of the reasons the company adopted ISO 14001 was to get external legitimacy (Testa et al., 2014a). Since accounting approach employed to assess internal efficiency, using market-based may deliver different conclusion.

Table 2 indicated that the indirect impact of environmental management systems (EMS) on financial performance (FP) through environmental performance (EP) as mediator variables was insignificant, P value is 0.115 > 0.05. It can be concluded that the role of environmental performance in mediating the relationship between environmental management systems and financial performance is not significant. Insignificance of direct relationship between the environmental management system and financial performance causes the condition for testing mediator cannot be fulfilled. In sum, it can be implied that financial performance is not generated directly by environmental management system adoption, but rather a result of good environmental performance. It means that improvement in financial performance would be generated if the company has superior environmental performance that resulted from better EMS adoption.

Table 2: The Direct Effect of EMS, Environmental Performance and Financial Performance

Indirect Path Coefficient		
	EMS	EP
ROS	0.103	
P-Value		
	EMS	EP
ROS	0.115	

## 5. Conclusion

In summary, the study concludes that the relationship between environmental management system and financial performance cannot be mediated. The relationship among three variables seem like a sequence. The better the implementation of environmental management system the higher the environmental performance, and the higher the environmental performance the greater the profit generated. Indonesia government may provide tax incentive to improve the company's participation in environmental management systems. Future research considers the maturity of company in adopting EMS, tries to test beyond compliance company and obey company separately and employ market-based measure as the indicator of financial performance.

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