Implementing Health Safety Environment (HSE) Process Management to Improve HSE Performance, Competitive Advantage and Financial Performance

Agustinus Hariadi Djoko Purwanto[1], Budi Suharjo[2], Ujang Sumarwan[3], Heny K. Daryanto[1]

[1]Graduate School of Management and Business Bogor Agricultural University, Indonesia
[2]Department of Mathematics and Graduate School of Management and Business Bogor Agricultural University, Indonesia
[3]Department of Family and Consumer Sciences Graduate School of Management and Business Bogor Agricultural University, Indonesia

Abstract. *Performance of health safety environmental (HSE) has been tightly demanded by stakeholders (customer, government, public, NGO, employee) and become essential factors of organization's competitive advantages. High HSE performance leads to improving customer satisfaction, legitimacy and reputation from which better financial performance can be gained. In order to do that, companies must implemement HSE process management. The research aims to investigate effects of the four constructs, namely process management, HSE performance, organization's competitive advantage and financial performance. The study uses descriptive and quantitative statistical methods involving 119 companies of which SEM is used to see linkages between factors. The testing results show that the process management gives significant positive effect to HSE performance after which it simulataneously affect significant and positively to competitive advantage but it has no significant relationship with financial performance. However, competitive advantage affect positively to financial performance. In conclusion, HSE process management improves HSE performance, which subsequently increases Competitive advantage but it does not affect financial performance. The increase of financial performance is given by competitive advantage.*

Key words: *HSE, Performance, Competitive Advantages, Financial Performance, SEM*

Abstrak. *Kinerja lingkungan dan keselamatan dan kesehatan kerja (LK3) telah dituntut dengan ketat oleh para pemangku kepentingan (pelanggan, pemerintah, masyarakat, LSM, karyawan) dan menjadi faktor-faktor esensial bagi keunggulan kompetitif organisasi. Untuk itu, perusahaan harus menerapkan manajemen proses LK3. Kinerja LK3 tinggi memberikan kepuasan pelanggan, legitimasi dan reputasi sehingga kinerja finansial dapat diperoleh. Penelitian ini bertujuan untuk mengamati pengaruh-pengaruh empat konstruk, yaitu Manajemen proses LK3, Kinerja LK3, Keunggulan kompetitif dan Kinerja finansial. Penelitian menggunakan metode analisa deskriptif dan kuantitatif yang meliputi 119 perusahaan dimana SEM diterapkan untuk melihat hubungan-hubungan antar faktor secara simultan. Hasil penelitian menunjukkan bahwa Manajemen proses LK3 memberikan pengaruh positif terhadap Kinerja LK3 yang selanjutnya secara simultan memberikan pengaruh positif terhadap Keunggulan kompetitif dan tidak memiliki pengaruh signifikan terhadap Kinerja finansial. Tetapi, Keunggulan kompetitif memberikan pengaruh positif terhadap Kinerja financial. Kesimpulan yang diambil adalah penerapan manajemen proses LK3 meningkatkan Kinerja LK3 yang selanjutnya meningkatkan Keunggulan kompetitif tetapi tidak mempengaruhi Kinerja finansial. Peningkatan kinerja finansial diberikan oleh keunggulan kompetitif.*

Kata kunci: *LK3, Kinerja, Keunggulan Kompetitif, Kinerja Finansial, SEM*

Received: 11 Desember 2013, Revision: 10 Maret 2014, Accepted: 2 April 2014
Print ISSN: 1412-1700; Online ISSN: 2089-7928. DOI: http://dx.doi.org/10.12695/jmt.2014.13.1.5

1. Introduction

1.1. Management Issues

Occupational health and safety incidents and environmental pollution are inetivable risks faced by any organizations. In Indonesia, reported accidents and environmental pollution cases increase from year to year as shown in Table 1. The detail data on 2010 shows that of 86,693 occupational accidents occurences consisting of 1,965 deaths, 31 permanent disabilities, 3,662 functional disabilities, 2,313 partial disabilities and 78,722 full recovered (Pusat Data Tenaga Kerja 2013). On average, there are 7 deaths every day from occupational accidents, whilst wordwide data for occupational disease reveal that the death rate reaches up to 310.000 per year of which 146.000 deaths related to carcinogenic effects.

Table 1. OHS accident and environmental cases

Year	Safety accident	Environmental cases
2009	96.314	72
2010	86.693	114
2011	99.491	177
2012	112.321	225

In terms of environmental cases, these environmental pollutions are resolved in courts or mediation scheme. Both might end up in sanctions given to 'polluters' either as criminal or administrative sanctions. Three examples of legal decision are the mining company having environmental accusation on Buyat (North Sulawesi) agrees to pay at minimum US$ 350 millions, PT Adei Plantation Industri was accused to forest fire in Riau has to pay IDR 9 billion, MT Natuna Sea accused to pollute sea water has to pay US$ 2.6 million (*www.menlh.go.id*). Other losses faced by these companies are profits during operation banning from government, damaged reputation and business opportunities. At the same time, pressures from stakeholders are increasing from years to years. Government in many countries play dynamic roles in issuing and enforcing tighter HSE (Health Safety Environment) regulations in order to reduce HSE accident occurences. As well as, surrounding communities demand for free from nuisances impacted by environmental pollution (water, air, soil, flora, fauna, noise, odour, vibration) and from increasing safety risks as a result of companies' operations. Investors, bankers and insurance companies put environmental and OHS performance in their financial evaluation and investment decision-making. To make it worse, employees through industrial relationship mechanism require for safe and healthy working place.

Organizations have struggle to address these demands by means of applying what required by regulations and international standards into their HSE management practices. However, high number of Occuppational Health Safety (OHS) accident and environmental pollution suggest only that there are gaps between the stakeholders' expectation (government, society, customers, employees, NGO) to today's HSE performance as a result of HSE process management. Other than that, there are opinions that contribution of environmental and OHS performance, when achieved, has not guaranteed to give competitive advantage and financial benefits except spent internal resources. This condition pushes necessity to do a research investigating relationship between environmental and OHS management and performance as well as competitive advantage and financial performance.

1.2. Research Issues

Research has been carried out to investigate effect of environmental management to financial performance of which this is a natural interest. Stanwick and Stanwick (2000), Zhao (2006), Schneider (2008), Moneva and Ortas et al (2009), Bae (2009) use indicators such as Return on Revenue (ROR), Return on Asset (ROA), Operating Revenue (OPR), cost of debt, sales and stock price. These reseachers review quantitative direct environmental matters indicator that are pollutant

concentration, pollution load and quantified indirect environmental indicator such as environmental openness, effectivenss of environmental management system. Results of the studies provide that environmental performance increase financial performance (Stanwick and Stanwick 2000, Schnieder 2008), whereas others give opposite ones (Zhao 2006). The third group ends with neutral effects of environmental factors to financial performance. Other group of reseachers explores environmental impacts partially in which it is part of other larger construct such as CSR, where environmental and OHS is comprised in the CSR. Velde et al (2005), Moneva and Ortas (2009), Mc Peak and Dai (2011) proves that CSR or HSE in it gives economical benefit to companies. Yet, a larger construct cannot explain a more specific effect from environmental or OHS factors instead of as combined factors.

Srivastava et al (1998) introduce a marketing concept called shareholder value, which encourages investigation on intangible indicators. As mentioned by Fernandez (2002) that financial measures orientate on the past, yet non-financial ones lead to future business performance. Some research iniate to see intangible benefits of HSE matters as a way to attain competitive advantage. Young (2000) found that customer satisfaction provides financial benefit in the long term. GEMI (2005) and Funk (2003) make a model regarding improvement of intangible and tangible asset generated from internal management to include the needs to meet demand on HSE aspects from stakeholders. Croft Kan (2006) proposed terms of legitimacy, reputation, and CSR to represent competitive advantage, which is then added by Peters (2007) in the form of customer satisfaction. The research shows that HSE performance can give positive effect to business performance through competitive advantage. It is seen the importance of obtaining high HSE performance and its subsequent effects to business perspective represented by Competitive advantage and Financial performance.

Referring to the management problems illustrated above, it can be seen that companies have to manage their HSE risks in order to avoid environmental pollution and Occupational health safety accidents, which can lead to various losses suffered by organization and create legal problems. The control over HSE risks through process management could also be used as ways to meet companies' stakeholders demands from which tangible benefits in the form of increase financial performance and intangible benefits in the form of competitive advantage can be gained. Furthermore, referring to research problems, a comprehensive model consisting of HSE management system or process, HSE performance, Competitive advantage and Financial performance have not been carried out by other researchers. With that reasons, this study aims to examine relationship between HSE process management, HSE performance and Competitive advantage and Financial performance.

2. Hypotheses Development

The increasing intensity in HSE management and demands to improve HSE performance has made companies to allocate their resources after which it raises questions on relationship between HSE management system or management process and HSE performance which affects gaining Competitive advantage and profits. GEMI (2005) claims through a concept that there is solid evidence of HSE process management and associated HSE performance contributing to shareholder value consisting as tangible and intangible benefits. Tangible performance consists of increase in profit, sales volume, nett-profit, cost of debt, return on asset, return on investment and so forth. Intangible performance is non-measurable indicator such as company growth contributed by organization management execution including brand equity, human resource capital and strategy execution (Hoffman, 2000). HSE performance is comprised of rate and severity of incidents, percentage of regulation compliance, concentration of pollutant in environmental media (water, air, soil), and number of occupational health cases.

GEMI (2005) makes an illustration of interlinkage between shareholder values in the following drawing:

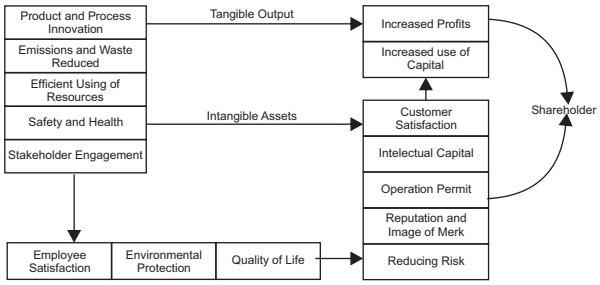

Figure 1 HSE Implementation to Tangible and Intangible Assets (GEMI 2005).

The above model shows that HSE management, which is capable of creating product and process innovation, reducing waste emission, conserving natural resource, protecting safety and health, and engaging stakeholder involvement, will lead to two outputs. These are tangible and intangible asset. Tangible asset is related to an increase in profit and capital utilization. Intangible asset includes customer satisfaction, relation of customer, corporate culture, operation permit, reputation and brand image, risk reduction, and intellectual capital (Fernandez, 2002).

Non-financial performance has advantages as it focuses on the intangible asset that drive most of the stakeholder value and a predictor of better future condition. Doyle (2004) states that Intangible asset comprising of R&D, knowledge, intellectual right and personnel skills, a world-wide network and brand are the main keys for the creation of company welfare. Srivastava et al. (1998), Doyle (2004), Porter and Van der Linde (1995) agree that intangible asset can be utilized in strategy to win competition and give long-term benefit. A supporting fact to these opinions is that ratio of market value to book value of companies listed in the Fortune 500 is around 3.5. This means that more than 70% lay on the intangible asset (Srivastava et al. 1998).

2.1. HSE Process Management

Management has a system or process dimension (Agarwal, 2002), which relates to integrated ideas, things and personnel or it is comprised of complex combination of activities, authorities and correlation among working process, methods, technical and environment. For instance, a procedure to handle HSE complaints stipulate a process in term of actions to document HSE complaints, evaluate their validity, investigate root causes and finally solve the problems. Process defines what are the inputs (data, waste, energy, etc), transformation of those inputs (risk analysis, processing units, implemented procedures, etc), and outputs (information, treated wastes, reduced energy consumption). Alexopoulos (2011) states that the desired development of the corporate environmental performance considered as outputs can be accomplished by the following processes: identification of processes for improvement; prioritizing processes for improvement; and locating the dimensions of operations in the process needed to improve.

In the management system modeled based on EMS ISO 14001: 2004 and OHSAS 18001: 2007, process elements includes risk analysis, objectives, regulation compliance evaluation, PPE (personnel protective equipment), EOP (end of pipe), procedure, permit to work, engineering, 3R, Integration, substitution, elimination, monitoring, audit, emergency and contractor (Kaur 2011). Implementation of this process or system will enable organizations to maintain consistency and improve their HSE performance continuously (ISO 14001: 2004, OHSAS 18001: 2007).

Lorton (2006) and Loebakka (2008) defines four hierarchy to differentiate implementation degree of companies' HSE processes: 1) first hierarchy means to prevent risk generation in the production lines covering elimination and substitution, 2) second hierarchy is to return generated risks released from production lines covering 3R and engineering, 3) third hierarchy is to reduce the reduced risk prior to be released

to outside covering procedures, permit to work, 4) fourth hierarchy is to minimize level of contacts between risks and objects covering PPE and EOP. Both researchers state that the higher the hierarchy of processes selected, HSE performance will be better. For instance, operating wastewater treatment plant (WWTP) representing EOP can reduce impacts degree to environment, whilst applying 3R can even reduce risk prior to contact to the surrounding environment. Furthermore, to some extent by applying 3R, the plant does not even need the WWTP. Reffering to this discussion, hypothesis 1 is developed which states:

Hypothesis 1: HSE process management affects positively to HSE performance.

2.2. HSE Performance

Organizational performance is a transformation of inputs into outputs for achieving certain outcomes. HSE performance can be categorized into these indicators: number of OHS accidents or environmental pollution, level of HSE compliance to applied regulations and of HSE overall performance. Rowley (2009) suggests that incidence rates are only a portion of safety performance. Indonesian regulation mandates companies to report annually on Frequency rate (FR) and Severity rate (SR) of their operation, which summarizes number of safety incidents. PROPER (Industrial rating on environmental performance) defines environmental performance as compliance level to applicable regulations: Black (major non-compliance or 100% missed a regulation requirements), Red (minor non-compliance or 20% deviates from threshold limit), Blue (exactly compliance or 100% compliance), Green (beyond compliance or better than 100%) and Gold (beyond compliance and undertaking special performance) (www.menlh.go.id). This research defines indicators of HSE performances construct consisting of: a) rate of environmental incidents, b) rate of OHS incidents, c) level of compliance to HSE regulations, and d) HSE overall performance.

Researchers have shown interest on high HSE performance effects to other aspects of organization elements. Godbey (2006) suggests that improving behaviour-based safety has given positive effect to other organizational variables such as productivity and quality which increases their reputation. Alexopoulos et al (2011) provides empirical findings, which reveal that improved environmental performance is a potential source of competitive advantage leading to more efficient processes, improvements in productivity, lower costs of compliance and new market opportunities. Evidence shows that stringent environmental regulations will lead to more competition, which will stimulate innovation and efficiency, providing a theoretical basis for the win-win perspective (Porter 1991). As a result, firms that abide by environmental regulations secure major environmental improvements and can win by ameliorating productivity, and reducing resource usage and costs. Referring to the above discussion, this research develops hyphotesis 2.

Hypothesis 2: HSE performance (rate of environmental incidents, rate of OHS incidents, level of compliance to regulations, overall HSE performance) affects positively to Competitive advantage.

2.3. Competitive Advantage

Competitive advantage is a superior performances above of its competitors for which company has to make differentiation to itself from the perspective of current and future customer (Porter 1991). There are two types of competitive advantage: low cost and differentiation (focused on tangible aspect). Barney's (1991) *in* Peters (2007) and Ferguson (2006) elaborate element of company to support competitive advantage are value, scarcity, difficult to imitate, un-substitutable and dependency. Elements of competitive advantage on environmental issues can be interpreted as company motivation to competition, legitimacy (licence to operate), CSR (economic, environmental, social, human

rights, society) and reputation (Croft Kan et al 2006). He undertakes a research on the correlation of Corporate Environmental Behavior (CEB) and Competitive advantage led to conclude that corporation is motivated by competition, legitimacy, and CSR and finally these corporates take action to reduce environmental impacts. Moon (2005) find that big companies and companies having close relationship with customer tend to participate in environmental protection program to increase green image for which strengthen competitive power in market. The study result shows that participation in environmental protection is not always correlated with intensity in capital investment, financial performance, public pressure, and government pressure. Based on this discussion, this research determines indicators of competitive advantage construct consisting of customer satisfaction and customer complaints (Moon 2005), legitimacy and cooperation with external parties as well as reputation and image (Croft Kan et al 2006).

Although, being competitive is major contributor of organization business sustainability and inherent performance, it is always interesting to know how this competitive advantage improves financial performance. Peters (2007) shows that there is a statistically correlation between CSR and company performance. Company does not only enhance its financial power by investing and having CSR reputation, but superior reputation significantly contribute to superior competitive advantage (company performance is measured relative to average of industrial performance). Oeyono et al (2011) investigated effect of Indonesian companies' CSR consisted of core indicators as follows: economic, environmental, social, human rights, society, and product responsibility. The study reveals that there is a positive relationship between CSR and profitability, although it is weak (18 per cent for EBITDA and 16 per cent for EPS). Similarly, Velde et al (2005) find that investors are ready to pay premium to companies having good management of their relations with shareholders, clients and suppliers.

Referring to Peters (2007), Oeyono et al (2011), and Velde et al (2005), the hypothesis 3 is defined which states that "Competitive advantage (customer satisfaction, customer complaints, reputation, award, legitimacy, and coordination externally) affects positively to Financial performance (sales increase, net-profit increase and ROA)

Hypothesis 3: Competitive advantage affects positively to financial performance

2.4. Financial Performance

Although there are some different opinions about selection of indicators for measuring CFP (Corporate Financial Performance), the most common reflective indicators chosen for measuring the CFP factor in accounting research have been identified. Firstly, These are return on assets (ROA), profit margin, return on equity (ROE), which are considered as relative magnitudes. Secondly, cash-flow and operating profits which are considered as absolute magnitudes. Fernandez (2002) notes that traditionally company performance is measured from financial parameters such as Return on Asset (ROA), Return on Investment (ROI) atau Return on Sales (ROS). Considering to non-financial respondent of this research, indicators of Financial performance construct selected is increase in sales, increase in nett-profit and ROA.

Impact of HSE management system to financial performance has not been confirmed since there is not any single pattern of the impact. Some researcher find that HSE performance has given positive impact, whilst others have not and the rest research results have been just given neutral comments. Watson et al. (2004) state that EMS implementation does not negatively impact to a firm's financial performance. Whilst, Moneva and Ortas (2009) analyse environmental and financial performance of a sample of 230 European companies using a partial least squares model (PLS) which support the idea that enterprises obtaining higher rates of environmental performance shows better financial performance levels in the future.

Stanwick and Stanwick (2000) investigation shows that high financial performers have higher incidences of environmental policies and/ or descriptions of environmental commitments than low performers. The highest commitment is owned by medium performers. Kim (2012) studies on heavy pollution industries which cannot reach to certain relationship due to heterogenity of firms examined or it ends up with neutral relationship.

Zhao (2006) carries out research on the effect of EMS ISO 14001 to financial performance by comparing between companies that have and have not implemented the EMS. The research result reveals that industry with high resource consumption (automotive, chemical, industrial machinery and semiconductor) tends to seek for ISO 14001 certification. Furthermore, it is proved that implementation of EMS reduce ROA (Return on Asset) and ROR (Return on Revenue) but it has not effect to OPR (Operating Revenue). Noh (2012) has a research results indicated that profitability variables (ROA1, ROA2, ROS, Stock price, and Tobins Q) shows immediate positive abnormal effects after firms applied for the certification, while the market benefit variables (Sales growth rate and SALES/ASSETS) shows gradual improvements after obtaining the certification. ISO14001 also shows a positive effect on the internal process improvement (COGS/SALES). Overall, ISO14001 was found beneficial to the firm in the long run from the perspectives of profitability, internal process improvement, and market benefits. Referring to Stanwick and Stanwick (2000), Zhao (2006) and Noh (2012), this research develop hyphotesis 4 as follow: HSE performance (rate of environmental incidents, rate of OHS incidents, level of compliance to regulations, Overall HSE performance) affects positively to Financial performance (sales increase, net profit increase, and ROA).

Hypothesis 4: HSE performance affects positively to financial performance.

2.5. Framework of Thought

Facts as illustrated in the introduction show that environmental and OHS accidents still happen in high number and severity although companies have implemented HSE management system and made effort to achieve high HSE performance. Apparently, organization requires a process or a system to manage their HSE risks. These are carried out by undertaking series of activities such as risk assessment, objective development, compliance evaluation, PPE, EOP, procedure, permit to work, engineering, 3R, integration, substitution, elimination, monitoring, audit dan contractor. Implementation of those 16 indicators of process management is expected to increase HSE performance that can be seen as reduced rate of environmental and OHS incidents, increased level of regulation compliance and increased in overall HSE performance.

Accordingly, it is expected that low environmental and OHS incidents increase customer satisfaction and decrease customer complaints as their concerns are well addressed. Also, obtaining green or gold level of PROPER or best practices in OHS gives high reputation and image to companies. As well, complying to requirements of government regulations and all external parties provides government and public legitimacy to operate. Customer satisfaction, customer complaint, reputation, image, legitimacy and good external relationship are grouped as indicators of competitive advantage.

Eventually, the competitive advantage should affect positively to financial performance representing sales increase, net-profit increase and associated ROA. Reputation and Image has given assurance to all stakeholders (customer, government, investor, banks, insurance) to continue or expand the business cooperation. The legitimacy and good external coordination of company gives the same assurance for any stakeholders in particular government and surrounding communities, which enable companies to maintain long-term business sustainability.

Directly, HSE performance provided from best practices such as cleaner production reduces cost of HSE management by which net-profit is increased. Success of company in reducing or replacing toxic wastes as demanded by stakeholders will have led customers to maintain contracts.

Extracting from the above discussion, the model consisting of inter-relationship between HSE process management, HSE performance (rate of environmental incidents, rate of OHS incidents, level of compliance to regulations, and overall HSE performance), competitive advantage (customer satisfaction, customer complaint, reputation, image, legitimacy, and cooperatin with externals) and financial performance (sales increase, nett-profit increase and ROA) is shown in Figure 2. The model shows that HSE performance affects simultaneously both to companies' competitive advantage and financial performance in which competitive advantage affects financial performance.

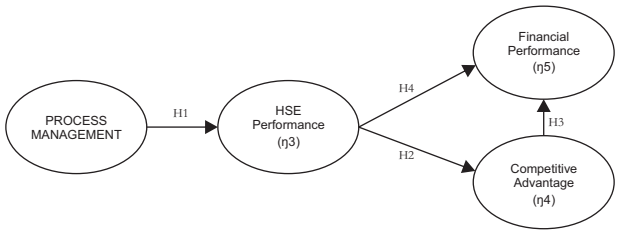

Figure 2. Framework of Thought on the HSE Management Effects to Competitive Advantage and Financial performance

The above framework of thought is comprised of three (3) relationships from which four propositions are formed. Hypothesis to be tested are as follows:

- H1: HSE process management has positive effect to HSE performance
- H2: HSE performance has positive effect to Competitive advantage
- H3: Competitive advantage has positive effect to Financial performance.
- H4: HSE performance has positive effect to Financial performance.

3. Methodology

3.1. Location and Time

Respondent of the research are companies operating in Indonesia spreading in island of Java, Sumatra, Sulawesi and Papua comprising of 20 industrical sectors (including oil and gas, mining, pharmaceutical, chemical, textile, petrochemical, electronics, electrical, basic metals, machinery and shipping). The survey is conducted on July-October 2012.

3.2. Data Source

The research involves primary data as well as secondary data. Primary data are done for respondents who are willing to be interviewed, whilst secondary data for respondents prefer to reply to the questionnaire.

3.3. Data Collection

Data collection are carried out by the following steps: testing the questionnaire to two companies, revising the questionnaire, contacting the companies to find out which of them agree to participate, disseminating questionnaire through emails to respondents who suggests to do so due to time and distance limitation, carrying out face to face interview, making telephone calls to ensure respondent understanding the questions, receiving email and clarifying some information.

3.4. Sampling Technique

The sampling technique is a purposive sampling in which respondent listed are contacted and asked to be involved in responding to the questionnairre. The sampling element is EMS, OHSAS, PROPER and SMK3 certified companies. Population is companies certified in EMS ISO 14001, OHSAS 18001, PROPER, and SMK3 (around 600 companies). Sampling unit is an individual company applying HSE management. Sampling frame is list of EMS and OHSAS certified companies.

3.5. Analysis Method

The research uses descriptive Structural Equation Model (SEM) which function to test the statistical model as depicted in Figure 3.

SEM analysis is an analysis based on Confirmatory Factor Analysis (CFA), a method that combines correlation analysis, regression analysis, traffic analysis and factor analysis (Suharjo, 2007).

Figure 3 reveals Structural and Measurement Model consisting of exogenous variable called HSE performance and endogenous variable, which are Competitive advantage and Financial performance.

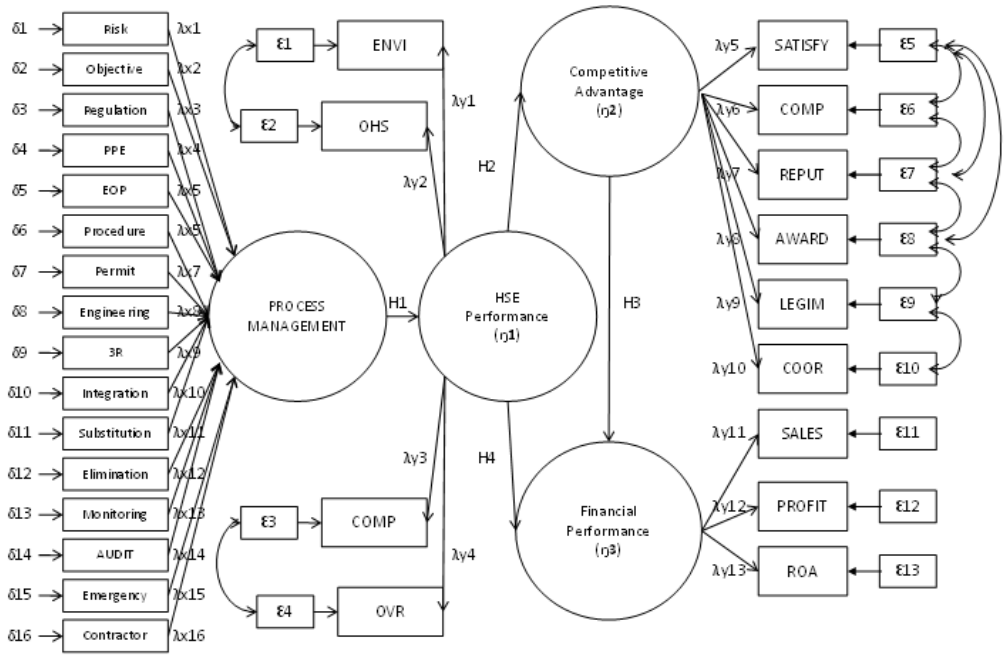

Figure 3. Structural and Measurement Model

Measurement scale used is Likert scale at 5 (five) points, of which score 1 is defined as Very disagree (Very bad), score 2 as Dissgree (Bad), score 3 as Neutral, score 4 as Agree (Good) and score 5 as Very agree (Very good). Definition of the research variabel is as follows: HSE process management is sub-systems configuring the overall management system. It is grouped into 16 (sixteen) indicators: conducting risk assessment (X1 or Risk), objective development (X2 or objective), regulation compliance (X3 or regulation), personal protective equipment (X4 or PPE), end of pipe treatment (X5 or EOP), implementing procedures (X6 or procedure), permit to work (X7 or permit), engineering control (X8 or engineering), reuse, recycle and recovery (X9 or 3R), integration of environmental and safety (X10 or integration), elimination (X11 or elimination), substitution (X12 or substitution), monitoring (X13 or monitoring), audit (X14 or audit), emergency (X15 or emergency), and contractor (X15 or contractor).

HSE Performance is a measure of both positive and negative output of HSE management implementation. Latent variable of HSE performance covers 4 indicators, which are frequency and intensity of environmental incidents (Y1 or Envi), frequency and intensity of OHS incident (Y2 or OHS), level of compliance to HSE regulations (Y3 or Comp), and overall HSE performance (Y4 or Ovr). Competitive advantage is a company performance beyond average or above its competitors due to it is capable to create difference from the perspective of customer today and in the future. In this research, latent variabel of competitive advantage is represented by 6 indicators, which are increased customer satisfaction (Y5, Satisfy), reduced or none of customer complaint (Y6, Comply), increased reputation (Y7 or Reput), increased image (Y8 or Award), Legitimacy to operate from stakeholders (Y9 or Legim), and good cooperation with stakeholders (Y10 or Coor).

Financial performance is a measure of company management achievement in financial terms. In this study, financial performance consists of the following indicators: Increase in sales volume (Y11 or Sales), Increase in net profit (Y12 or Profit) and Return on Asset (Y13 or ROA). The results of activities of an organization or investment over a given period of time are the sales performance. It can be measured by the total dollar amount collected for goods and services provided. Net income can be calculated by subtracting expenses from revenue. In terms of reporting revenue in a company's financial statements, different companies consider revenue to be received or recognized different ways.

4. Result

This section discusses relationship pattern of the four latent variables to obtain a complete picture of the relationship between HSE process management, HSE performance, competitive advantage and financial performance. The structural model analysis is associated with evaluation of coefficients or parameters that indicate a causal relationship or effects of a latent variable to other latent variables. In this study, causal relationships hypothesized refer to norms that are used to analyze the measurement model and the structural model test results (Hair *et al.* 2004). Estimation to the model coefficient follows ULS rules by referring to guideline whether the proposed measurement model fit or not to data

The test results can be seen in Figure 4 below.

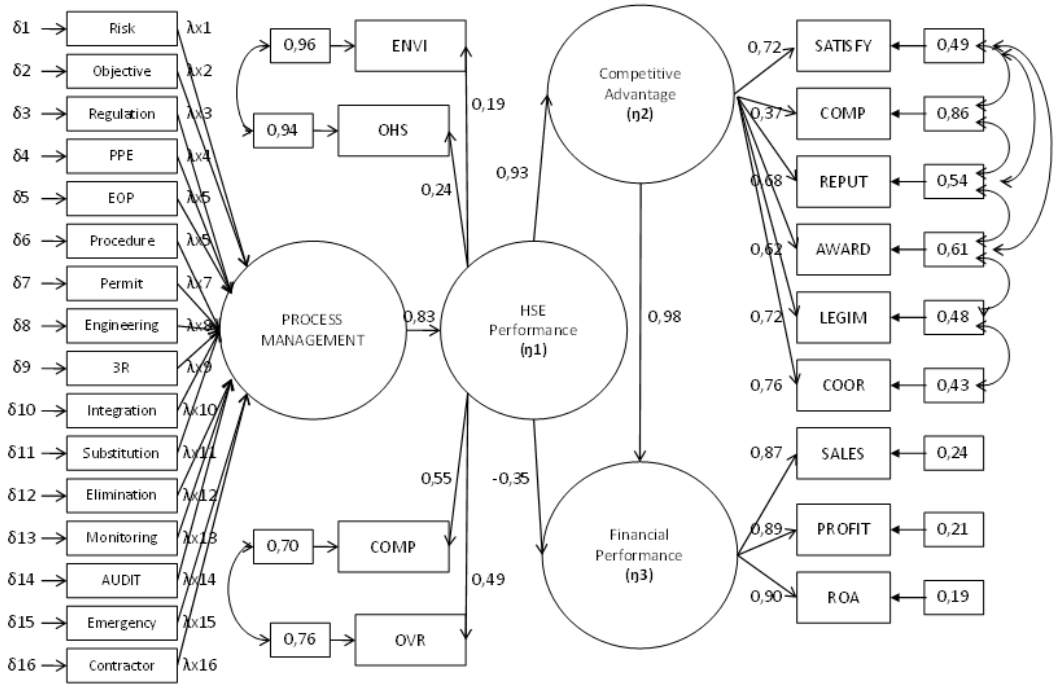

Figure 4. Structural and Measurement Model Test Result

4.1. Reliability Test

The research gives reliability values provided as CR (Construct reliability) at a value > 0.70 to all paths except for HSE performance as presented in Table 2. The CR value of HSE process management, HSE performance, competitive advantage, and financial performance are 0.74, 0.33, 0.75, 0.90 respectively.

Construct Reliability (CR) is a measurement revealing consistency level or indicator stability in representing latent variable. Reliability testing is useful to test confidence limit and consistency of measuring device through applicable questionnaire. The reliability level increases with the addition of indicator variable yet it requires higher number of observed data.

Reliability evaluation is done using coefficient of alpha Cronbach. Kaplan and Saccuzzo (1989) propose that theoretically alpha coefficient value which is above 0.70 defined as reliable. Furthermore, CR value >= 0.5 is considered as sufficiently reliable whilst CR =< 0.70 is not reliable. In conclusion, the tested model is reliable for the case of the HSE process management, competitive advantage and the financial performance.

Yet, it has a lack of reliability for the case of HSE performance. reason for this is that there might be difficulty experienced by respondents in differentiating between environmental pollution with safety accident since this considers as the same occurrence when a safety accident happened there is also environmental pollution vice versa.

Tabel 2. Reliability Test Result

Variable	Sign	Indicator	SLF	Error	CR > 0,70	VE > 0,50
HSE Process Management	Risk (X1)	Risk analysis	0.63	0.61	0.54	0.44
	Objective (X2)	Establishing HSE objectives	0.73	0.47		
	Regulation (X3)	Evaluation regulation compliance	0.69	0.53		
	PPE (X4)	Wearing PPE	0.54	0.71		
	EOP (X5)	Operating EOP	0.60	0.63		
	Procedure (X6)	Implementing procedures	0.58	0.67		
	Permit (X7)	Implementing permit	0.69	0.52		
	Engineering (X8)	Implementing engineering control	0.83	0.35		
	3R (X9)	implementing 3R (reuse, reccle and recovery)	0.69	0.52		
	Integration (X10)	Integrating environmental and OHS	0.73	0.46		
	Substitution (X11)	Substituting material and process	0.65	0.58		
	Elimination (X12)	Eliminating risks sources	0.57	0.68		
	Monitoring (X13)	Monitoring processes	0.66	0.56		
	Audit (X14)	Auditing system implementation	0.51	0.74		
	Emergency (X15)	emergency response	0.71	0.50		
	Contractor (X16)	controlling contractor risks.	0.76	0.43		
HSE Performance	ENVI (Y1)	Environmental pollution	0.19	0.96	0.33	0.14
	OHS (Y2)	OHS accident	0.24	0.94		
	COMP (Y3)	Compliance Status	0.55	0.70		
	OVR (Y4)	Overall performance	0.49	0.76		
Competitive Advantage	SATISFY (Y1)	Customer satisfaction on HSE	0.72	0.49	0.75	0.35
	COMP (Y2)	Customer complaint on HSE	0.37	0.86		
	REPUT (Y3)	Reputation on HSE	0.68	0.54		
	AWARD (Y4)	External Award on HSE	0.62	0.61		
	LEGIM (Y5)	Legitimacy from HSE	0.72	0.48		
	COOR (Y6)	External cooperation due to HSE	0.76	0.43		
Financial performance	SALES (Y7)	Total sales increase	0.87	0.24	0.90	0.83
	PROFIT (Y8)	Net profit increase	0.89	0.21		
	ROA (Y9)	ROA	0.90	0.19		

The Validity Extracted (VE) value of HSE process management (at 0.44), HSE performance (at 0.33), competitive advantage (at 0.35) and financial performance (at 0.83). Validity test is useful to analyze validity of measuring tool, which is the questionnaire. The test is based on correlation value of calculated r compared to value of r table or probability value (p-value). The measuring tool is valid when correlation coefficient (calculated r) > r table or p value < 0.05. Again, due to a tendency of similarity in defining indicators of HSE performance has reduced the validity level.

The measuring tool is valid when correlation coefficient (calculated r) > r table or p value < 0.05. Again, due to a tendency of similarity in defining indicators of HSE performance has reduced the validity level. Evaluating VE value of competitive advantage, it can be explainted that the terms of customer satisfaction and customer complaint are more familiar when they are correlated to product quality but rarely to environmental or OHS aspects. The respondent might not have comprehended the terms nor have information regarding them.

4.2. Analysis of Overall Model

Overall model fitness analysis named as Goodness of Fit (GOF) aims see how good the matchness between data. Tabel 1 shows the result of model fitness tests based on (a) absolute, (b) incremental and (c) parsimonious fit model compared to acceptance standard of each indicator. The table reveals that the analysis of overall model concluded that the model is proved to be Good fit for all applied testing criteria.

The study result has a RMSEA value at 0.079, which is lower than the maximum requirement (<0.08) and GFI value at 0.965, which is higher than the minimum requirement (>0.90). This means that the overall model meets with the test criteria of the absolute fit model. In other words, the test performance to the model is defined as Good fit. The absolute fit model matchness (RMSEA and GFI) functions to determine prediction level of overall model (structural and measurement model) to correlation and covarian matrix. RMSEA is to measure deviation of parameter value of the model to population of the covarian matrix (Hair et al, 2004). Hair (2004) mentions that RMSEA is the most informative model fitness measurement.

Research result also shows that the value of CFI = 1.000; NFI = 0.955, NNFI = 1.018, IFI = 1.016 and RFI = 0.950, which are higher than the minimum requirement at 0.90, 0.90, 0.90, 0.90, and 0.90 respectively. These results suggest that all the indices meet the standard or the model is categorized as Good Fit. Incremental fit model measurement is to compare proposed model with a basic model, which is often known as null model or independent model. As applied above the test consists of several testing tools alike: (a) CFI (Comparative Fit Index), (b) NFI (Normed Fit Index), (c) NNFI (Non-Normed Fit Index), (d) IFI (Incremental Fit Index), (e) RFI (Relative Fit Index). Finally, the parsimony fitness model measurement provides values of AGFI and PGFI at 0.958 and 0.807 in comparison to the minimum requirement at 0.90 and 0.50.

Therefore, the overall model tests results can be categorized as Good Fit. The parsimonius fitness model measurement is to compare between proposed model with basic model in which all variable within the model are free from one to another. Following to parsimony principle, which means that the test obtains the highest degree of fitness to each degree of freedom. This consists of the following fitness tests: (a) AGFI (Adjusted Goodness Fit Index) and (b) PGFI (Parsimony Goodness Fit Index).

4.3. Analysis of Relationships

The hyphotesis tested in this model (Ho) is the matrix of the same population covariance sample matrix (Ho: S=S) and (H1#SS). Ho is accepted which means that the structural model (variance model) can be used to predict the structure (population variance) from the value of Chi-square (χ^2) and RMSEA. Ho is accepted if P-value (χ^2 test) higher than 0.05 or RMSEA less than 0.08 (Joreskog 1998 in Kusnendi 2008). The test result to the model yields P-value = 0.000 (< 0.05) and RMSEA = 0.037 (< 0.08). This means that overall empirical model can be adopted as accordance with the criteria set by Joreskog et al. (1996). Since it is accepted statistically, therefore model coefficient can be used as estimator of contributing value or effect of exogenous latent to endogenous latent variable.

The results of the measurement analysis of the effects of HSE process management, HSE performance (HSE), Competitive advantage and Financial performance (FP) are summarized in Table 4. The significance test to loading factor path shows that all have T value > T minimum (1.96 at a= 0.05) except for path between HSE performance to Financial performance. This means that all correlation defined as significant except correlation HSE performance and Financial performance. T tests show that correlation between HSE process management to HSE performance (9.30), HSE performance to Competitive advantage (7.27), Competitive advantage to Financial performance (15.17) and HSE performance to Financial Performance (-0.57).

Tabel 3. Resulf of Model Fitness Analysis

	Calculation result	Standard
Absolute fit model		
RMSEA	0,079	RMSEA < 0,08
GFI	0,965	GFI > 0,90
Incremental Fit Model		
NFI	0,955	NFI > 0,90
NNFI	1,018	NNFI > 0.90
CFI	1,000	CFI > 0,90
IFI	1,016	IFI > 0,90
RFI	0,950	RFI > 0,90
Parsimanious Fit Model		
AGFI	0,958	AGFI > 0,90
PGFI	0,807	PGFI > 0,50

Table 4. Measurement Analysis

Hypothesis	Correlation	Loading Factor	T value
1	HSE process management ® HSE performance	0.83	9.30
2	HSE Performance ® Competitive advantage	0.93	7.27
3	HSE performance ® Financial performance	-0.35	-0.57
4	Competitive advantage ® Financial performance	0.98	15.17

5. Discussion

5.1. Model Interpretation

The model analysis has confirmed fitness of the overall model, which suggest that HSE process management improves HSE performance after which it subsequently gives positive impacts both to competitive advantage directly and financial performance indirectly through competitive advantage. Although, it is found in this research that there is not a direct relationship between HSE performance to financial performance. Nonetheless, it can be concluded from the HSE model that increases HSE performance will improve companies' competitive advantage and financial performance. The following elaborates interpretation of the inter-relationship of the four constructs structuring the HSE model.

5.2. HSE Process Management Effects to HSE Performance

Hyphotesis 1 postulates that Process management (risk, objective, regulation, PPE, EOP, procedure, permit, engineering, 3R, integration, substitution, elimination, monitoring, audit, emergency and contractor) has positive effect to HSE performance. This is supported by the research findings as it has T-value of 9.30 and loading factor at 0.83. In general, the positive effects of HSE process management support previous research such as Robson et al (2006) and Santos et al (2011) who declare that environmental management process correlate with low accident (Robson et al 2006) and reduce incidents, improve organized working places and awareness (Santos et al 2011).

In particular to risk indicator (Y1 indicator), adequate risk assessment is essential to be done in order to prioritize control to high risks from which accident and pollution can be avoided and eventually increases HSE performance. This is similar to the concept defined by ISO 14001: 2004 and OHSAS 18001: 2007 which states that the structure of environmental management system and OHS management shall be based on risk assessment. In terms of Y4 to Y12 indicators which can be categorized into 4 hierarchy of control, this research reveals that the higher the level of control the better the HSE performance, which is similar to research found by Lorton (2006), Loebakka (2008) and Kim (2012).

As an illustration, substituting (second hierarchy of control) Pb-containing-solder to be free-Pb solder has directly reduced generation of hazardous and toxic waste generation that harms human health and environment. It also leads to a cost decrease needed to control the wastes in the form of permit fee, temporary storage facilities and fee to hazardous waste collectors. HSE audit and monitoring (Y13 and Y14 indicators) in the concept of Plan-Do-Check-Act is important stage to check whether plan including risk analysis has been carried out (Do) accordingly (ISO 14001: 2004, OHSAS 18001: 2007).

Any deviation shall be corrected immediately before it leads to incidents and failure of other HSE targets such as energy and water conservation or waste reduction. This is in support to result reported by Brahmasrene and Smith (2009) who have shown that safety audit is needed to uncover weakness of management system implementation. In addition, contractor indicator (Y16) completes to what Hong et al (2009) suggestion to do a continuing research to examine the linkage between supply chain as part of a business in dealing with suppliers and business performance both in terms of environmental and business matters. His research shows that there is a tendency of environmental orientation improves company's business performance.

5.3. Effects to Financial Performance

In this model, two constructs that influence financial perfomance are competitive advantage (hypothesis 3) and HSE performance (hypothesis 4).

5.4. Competitive Advantage Effects to Financial Performance

The study supports hyphotesis 3, which stipulates that financial performance is positively affected by competitive advantage because the T value of hypothesis 3 is higher than 1.96 or in other words there is significant relationship between competitive advantage and financial performance.

This means that indicators structuring competitive advantage which are customer satisfaction (Y5), customer complaint (Y6), reputation (Y7), image (Y8), legitimacy (Y9) and external relatioship (Y10) increases sales (Y11), nett income (Y12) and ROA (Y13).

Similar to this research result regarding effects of customer satisfaction and complaints, positive effects of customers' concerns on environment aspects are also found by Galdeano-Gomez (2008) who focuses on agriculture sector and uses linier regression. High performance in environment improves companies' profit and market share. Currently, customers have demanded high HSE performance level to their suppliers as a requirement of maintaining or increasing their business orders. The customers select only suppliers that are capable to meet requirements containing HSE targets including compliance to HSE regulation, zero pollution generation, zero safety incidents, substitution of ROHS (Restricted of Hazardous Substances) etc. They do not want to purchase products or services from their suppliers having environmental or OHS problems as these will affect supply continuity and reduce customers' reputation indirectly.

Furthermore, customers' continuous evaluation over suppliers' HSE achievement after supplying product will determine whether such business cooperation entitled to be prolonged or not. This factual illustration means that satisfying customers and preventing their complaints on HSE perspective give advantage over competitors, in case they cannot. In particular, oil and gas as well as mining industries have intensively applied CSMS (Contract Safety Management System). Once, companies are not listed in the CSMS database due to sub-standard HSE performance, companies are experiencing competitive disadvantages which lead to reduce in sales volume, nett-profit and Return on assets. The other results of this study suggest that reputation (indicator Y7) and image (indicator Y8) improve organizations's financial performance which in support to Siah (2009) and Gardberg (2006) stating that good

performing company has better reputation which lead to profit and non-economical gain. In Indonesian context, it can be explained as follows: Recently, environmental reputation and award can be gained from the national program alike PROPER (Business performance rating on environmental performance) and SMK3 award from the President of Government of Indonesia. Environmental categorized as very good to excellent reputation (Green, Gold level) received from PROPER award and SMK3 award has given direct positive effect to competitive advantage by means of allowing and adding business transaction.

Customers and suppliers are happy to put orders and deliver materials to organizations categorized in this list. In other words, gaining such reputation will give more sales. Oppositely, there is a regulation issued by Bank Indonesia (Indonesian Central Bank) which forbid any banks operated in Indonesia to give loans for ones listed as Red and Black level of the PROPER (Peraturan Bank Indonesia nomor 6/10/PBI/2004). Obviously, these bad reputated companies are experiencing disadvantage until the level is improved in the following year of awarding. In this respect, these companies suffer from limitation to investment and operational capital that will reduce their capabilities in selling products or services. Eventually, it decreases the performance of sales, nett-profit and ROA altogether.

Effects of legitimacy (indicator Y9) and good external relationship (indicator Y10) are positive to the financial performance. This is partly against result provided by Mugisa (2011) who examine effect of CSR in maintaining good relationship with communities in which his research reports that CSR reduces other financial performance indicators except sales. However, this research results is similar to CroftKan's (2006) and Wingard and Vorster (2001) who prove that environmental responsibility increases ROE, ROA, ROC and EVA as applied to companies in South Africa stock market.

Operations, which have good cooperation and legitimacy from stakeholders, have also given confidence to any stakeholders to do a long-term business and social relationships. Obviously, customers do not want sign any contract to an operation that has no licenses from government or social licences from its surrounding communities. For instance, one collection and treatment of hazardous and toxic waste in Karawang (West Java) has experienced a massive supply decrease from its industrial customers and suppliers to use its service after news that the central government was undertaking an investigation due to communities' complaints on environmental matters. Again, when a company is capable of maintaining its legitimacy and good relationship with surrounding, it keeps running its business to enable sustainability ones.

Other example on this issues is an environmental and safety dispute between a pulp and paper company operated in North Sumatra and its surrounding community has caused the operation suspended in the period of 2002-2009. This is definitely a very large business loss. This decision from the Central government was also triggered by gas leaks accident due to internal safety operation problem. Now, the paper plant has been re-operated whilst pulp plant is abandoned forever. Nonetheless, the company has already major loss of financial asset. Simply, these factual examples give a conclusion that bad reputation and coordination externally prevent businesses from producing and selling their products and services as well as jeorpidizing business existence. This research result is similar to research of Croft Kan (2006), which states that high reputation and award gives companies with better competitive advantage necessary to sustain the business.

5.5. HSE Performance to Financial Performance

Hyphotesis 4 stipulates that financial performance is positively affected by HSE performance. This study does not support the hypothesis 4 as seen that the T value of hypothesis 2 is lower than 1.96.

This simply says that HSE performance does not increase or decrease financial performance because the relationship path is insignificant. Therefore, this research result of HSE performance effect to financial benefits supports previous research, which state a significant relationship between the two factors. This results supports Nuraini and Kawedar (2011) and Watson et al (2004) who find that there is not a relationship between HSE performance and Financial performance. Zhao (2006) examines effect of EMS ISO 14001 to ROR, ROA, and OPR with variation of relationship. These are EMS reduces ROR and ROA but does not change OPR. Sudaryanto (2011) uses correlation method with a finding that environmental performance affects CSR but none to financial performance.

Djuitaningsih (2011) reveal that environmental performance increases ROA and ROE at the following year but it does not affect annual return. Whilst, at the same this research result is against other previous research which reports that HSE performance increase economical indicators (Schneider 2008; Clemens dan Bakstran 2010; Oeyono et al 2011; Moneva dan Ortas 2009; Mc Kinley 2008; Wingard dan Vorster 2001). Schnieder (2008) shows that environmental performance affects positively to economical measured indicated as cost of debt. Mc Kinley (2008) there is a positive relationship between corporate benefit dan environmental or social performance. In addition to that, Stanwick and Stanwick (2000) finds that corporate with high financial performance has implemented environmental policy. Peiris and Evans (2010) find that social environmental rank has not shown consistent relationship with stock market.

In general, this can be interpreted that company's sales, nett-profit and ROA are functioned of various business factors such as product quality, brand, marketing relations, technology of production, overall capabilities of organization and others. It seems that contribution effect of financial performance generated by HSE performance is still too low to give noticable contribution.

However, examining the negative loading factor value between the two constructs indicates to an agreement with general public thoughts in which implementing HSE management generates only additional capital and operational costs, which lead to deteriorate company's financial strength.

Environmental management cost can be in the form of new development of wastewater treatment plant in order to comply with applicable water pollution regulation (Government Regulation number 82/2002) or cost to develop hazardous waste temporary storage, which grows fast in number recently in Indonesia, in order to comply with (Government regulation number 18/2002). Other apparent costs are directly related to certification of various unit operations such as pressurized tanks (cylinder, compressor), boiler, electrical units (generator, electrical lines) as well as provision or repair of the existing ones. The money spent to do the above mentioned has substracted overall company income by which the net-income and ROA will be lower than when the HSE MS inexist.

On the contrary, companies realize that achieving to high HSE performance through an implementation of cleaner production or 4R (reduce at source, reuse, recycle and recovery) strategy is similar to applying process optimization, efficiency increase, productivity and so forth. It proves to have effect in reducting operational cost by minimizing waste volume, replacing non-environmental-friendly chemicals by which it reduces cost for additional chemicals or cost for end of pipe facilities. Insignificant contribution can be caused by the fact that there is not any factual and accurate calculation on the cost reduction provided by implementation of 4R (Reduce at source, Reuse, Recycle, and Recovery) strategy. Also, plants only adopt simple projects that do not require capital expenditures such reduction in energy or water consumption by only increasing employee's awareness without doing investment on technology and facilities.

Other examples is that lights (mercury or other high power lamps) can reduce substantial value of electricity consumption by replacing the lamps with low energy and more environmentally friendly products (e.g. LED). However, companies do not apply this but just ask for their employees to turn off electricity devices when not in use. This practice does not give substantial reduction of electricity consumption. In conclusion, the non-significant relationship between HSE performance to Financial performance is caused by limited HSE improvement projects that can give higher contribution to sales, nett-profit and ROA.

5.6. HSE Performance and Competitive Advantage

The research aims to see correlation between HSE performance and competitive advantage of the companies as postulated in Hyphotesis 2 stating that HSE performance (environmental incidents, OHS incident, compliance evaluation, and overall performance) has positive effect to competitive advantage (customer satisfaction, customer complaint, reputation, award, legitimacy and external relation). The result supports the hyphotesis as the T value is higher than 1.96 or there is significant and positive correlation between the two contructs at a value of 0.93.

5.7. Customer Satisfaction

The study provides evidence that achieving all indicators of HSE performance increases customer satisfaction and reduces customer complaints. This is in support to research conducted by Bae (2009) who finds the same result. Customers due to market orientation on HSE and their internal commitment to implement EMS ISO 14001 and OHSAS 18001 has added some portion in their order requirement regarding HSE item. They demand product supplied with MSDS (Material Safety Data Sheet), delivering truck with standardized condition (pre-operation checksheet, operation licence from government, certified driver), and suppliers' personnel who are capable to meet HSE rules applied in customers' working site. It goes further as some customers carry out HSE site audit to suppliers' facilities to verify that the operation do not and have potency to cause environmental pollution and OHS risks.

Therefore, meeting those customer HSE requirements will have prevented from their complaint and lead to customer satisfaction. In practical terms, many plants make supplier evaluation form containing quality, service, delivery, environmental and safety achievement with a variation of weight of the factors. Having low score in environmental and safety part will put the suppliers into less preference of having the customers purchase orders. In some cases, it relates to complaints and unsatisified measures. Companies being complained and dealt with unsatisfied customers are in the disadvantage position as opposed to their competitors which have not.

5.8. Reputation and Award

CrofKan et al (2006) finds that corporate environmental performance leads to be corporate environmental behaviour which are represented by competition, CSR, legitimate to operate and good external relationship. Mc Peak and Dai (2011) confirmed that environmental and OHS performance is part of CSR parts. General public concerns more on a company operation that endanger environmental and safety to people rather than on the company's business performance. One copper mining company in Indonesia has suffered severely from bad reputation as an environmental polluting and damaging operation facility. Although this issue is becoming a technical debate up to now, whether to continue the mining operation with obvious economical benefit or to stop at all which will protect rivers on site but no economical gain. Yet, prolonged publication on the damaged river and disturbed ecosystem has even raised issues on the banning of the operation or taking over the operation by Indonesian government. The issue has ultimately shifted to political one.

Consequently, the company has to experience tight and continuous inspections from various government institutions and other stakeholders for many reasons. In short, bad HSE performance (safety accident, river pollution, food poisoning to employees) has damaged reputation and prevented any award from local and central government.

On the opposite side, companies receiving PROPER green have an advantage to get trust from public and government as responsible business organizations. They are seen as company with high capability in overall perspectives beyond HSE capabilities. At least, the ones grouped as Blue, Green and Gold level are not banned from receiving financial loan from any banks operated in Indonesia. Similarly, receiving SMK3 certificate from the national program arrange by Ministry of Manpower has given a differentiation against competitors.

5.9. Legitimacy and External Coordination

Compliance evaluation and overall performance indicators will ensure whether companies are meeting requirements of government regulations and all stakeholders. This is to ensure that the operation is legimiate from government and communities. This is similar to ones reported by Suk (2008) who shows that variable of government pressure, non-government pressure, compliance and technology are affected by environmental conduct of organizations. Stakeholders other than customers do not care to quality of companies' product but they are exposed and give interest to companies' environmental and to some extent to OHS condition. Obviously, it is caused by the fact that surrounding communities, for example, could suffer from companies' environmental impacts in the form of as small as nuisance (noise, vibration, dust, etc) or as bad as carcinogenic effects due to release of heavy metals. Therefore, assuring to communities by proving that environmental and OHS impacts are in controlled will put the company in good relation with them.

In controlled means that there are not environmental and OHS accident, non-compliance and substandard overall HSE performance. This eventually leads to non-disruption to the operation and ensure companies' continuous and sustainaiable operation since the company is also legitimate to operate in the eyes of the communities.

HSE regulation compliance status of the organization gives legitimacy to operate both from government and surrounding community. Similar relationship between compliance and legitimacy are also reported by Mc Kinley (2008). His research states that regulation compliances are driven by government in the pursue of liability. Operations considered as having non-compliance issues have suffered from government continuous inspections and pressures from other stakeholders. HSE non-compliances can be found in the following conditions: no environmental and OHS permit, inadequate environmental document (UKL/UPL or AMDAL), inadequate facilities to mitigate HSE risks (wastewater treatment plant, hazardous waste temporary storage, etc), lacks in monitoring and reporting to government. This substandard situation will cause un-trust from stakeholders which lead to bad cooperation between companines and government or surrounding public.

Legitimacy is also needed at the earliest part of operation establishment as the Indonesian regulation requires environmental permit before an operation can be initiated as well as safety regulation. Thus, a company which does not have environmental and OHS permit at risks of being closed or temporarily closed down. It is essential to a company of having basic permit to ensure that no law is broken. As an example, one coal mining company in Kalimantan experiencing safety accident causing 4 fatalities has to stop its operation for 2 months covering large vessel of product, coal barge, hauling trucks, heavy equipment in mining areas. This means that the company market and opportunity is abandoned for a while.

6. Managerial implication

HSE performance does not give positive effects to financial performance in that many people agree on. Yet, it gives positive impacts to competitive advantage and to financial performance indirectly through competitive advantage. Overall, implementing HSE increases competitive advantage and financial performance. Therefore, top management should have not any barrier to fully apply his/her commitment to health safety and environmental management in order to reach the highest performance that indirectly will provide maximum profit. Committed HSE implementation relates to second reason that in the future the external pressures on HSE matters will increase by which manager should establish a solid and consistent HSE management system or if not it will be left behind by its competitor and market demand.

7. Research Implication

The research is done for 20 industrial sectors represented 119 respondents of which it is widely diverse and causes bias of the response. As an illustration, the HSE practices standards and practices are quite different between oil and gas industry and textile of which each respondent has a quite different answers to the questionnairre. Research on a particular industrial sector can be done to give a more specific and less biased results. The selection of HSE indicators needs to be improved since it shows a low CR and VE value. Although this is stille challenging for the researcher due to the fact that there is not any commonly accepted definition.

8. Conclusion

The research results reveal that competitive advantage and financial performance can be improved by high achievement of HSE performance through HSE process management. The HSE high performance increases customer satisfaction and reduces complaints, improves reputation and image from stakeholders as well as improves operation legitimacy and external relationship. All of these competitive indicators subsequently affect positively to companies' financial performance represented as sales increase, nett-profit increase and ROA. Although, the research shows that there is not a direct relationship between HSE performance and financial performance, the HSE process management can improve financial performance through competitive advantage.

Reference

Agarwal S. K. (2002). Environmental Management New Concepts. *Eco Informatics* 1.

Alexopoulos, I., Kounetas, K., & Tzelepis, D. (2012). Environmental performance and technical efficiency, is there a link?. *International Journal of Productivity and Performance Management*. 61(1):6-23.

Bae, H. (2009). *Measuring effects of the voluntary disclosure of environmental management performance: based on the US stock market* [dissertation]. State University of New York, New york.

Brahmasrene, T., & Smith, S. S.(2009). The influence of training, safety audits, and disciplinary action on safety management. *Journal of Organisation Culture,* 3(1).

Croft Kan, MPL. (2006). *Corporate environmental behavior and competitive advantage*. [thesis]. Hongkong : The Chinese University of Hongkong.

Djuitaningsih, R. (2011). *Pengaruh kinerja lingkungan dan kepemilikan asing terhadap kinerja finansial perusahaan* [tesis]. Fakultas Ekonomi dan Ilmu Sosial Universitas Bakrie, Jakarta selatan.

Doyle, P. (2004). *Value Based Marketing: Marketing Strategies for Corporate Growth and Shareholder Value*. John Wiley & Sons Ltd.

Epstein, MJ., & Young, SD. (1999). Greening with EVA. Management Accounting. ABI/ INFORM Global.

Ferguson, K. L. (2006). *Human resource management systems and firm performance*. [dissertation]. Kentucky: University of Louisville.

Fernandez, A. (2002). The Relationship between non-financial and financial performance masures: an empirical study in retail banking.[dissertation].

Funk K. 2003. Sustainability and performance. MIT *Sloan Management Review,* 44(2).

Galdeano-Gomez, E. (2008). Does an endogenous relationship exist between environmental and economica performance? A resource-based view on the horticultural sector. *Environ Resource Econ*, 40,73-89.

Gardberg, N. A. (2006). *How do individuals construct corporate reputations? examining the effects of stakeholder status and firm strategy on cognitive elaboration and schema complexity about firm performance.* [dissertation]. New York University, New York.

Global Environmental Management Initiative (GEMI). (2005). *Clear Advantage*: Building Shareholder Value.

Godbey, J. F. (2006). *The effects of behavior-based safety techniques on behavior variation, targeted and non-targeted safe behaviors and productivity and quality in manufacturing facilities* [disertasi]. Graduate Faculty of Auburn, Alabama.

Hair, Jr-J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Thatam, R. L. (2006). *Multivariate data analysis 6th edition*. Upper Saddle River. NJ: Pearson Education, Inc.

Hoffman, A. J. (2000). *Integrating environment and social issues into corporate practice*. Environment. ABI/ INFORM Global.

ISO 14001.(2004). I*nternational Standard: Environmental Management Systems* – Requirements with Guidance for Use. ISO/TC 207/ SC 1.

Kaur, H. (2011). Soft EMS, Hard EMS and environmental performance relationships: a review of the literature. *Journal of environment management and tourism*. University College Malaysia, Malaysia.

Kim, K. (2012). *Corporate environmental strategy, environmental performance and financial performance in the USA heavy polluting industries 1991-2005*. [dissertation and theses]. Boston University School of Management.

Kusnendi, M. S. (2008). *Model-model persamaan structural*. Alfabeta Bandung

Loebbaka, J. K. (2008). *Factors defining the relationship between safety management strategies and safety performance*. Alliant International University, San Diego, California.

Lorton, G. A. (2006). *Factors relating environmental management strategies and performance on environmental issues* [disertasi dan tesis]. Alliant International University, San Diego, California.

Mugisa, J. (2011). *The effect of corporate social responsibility on business operations and performance. Case study: vision group and Uganda Clays limited* [tesis]. Uganda Martyrs University, Uganda.

Moneva, J. M., Ortas, E. (2010). Corporate environmental and financial performance: a multivariate approach. *Industrial Management & Data Systems , 110 (2), 2010 pp. 193-210*.

Moon, S. (2005). *Contexts, timing, and corporate voluntary environmental behaviour: a new look at voluntary participation in the environmental protection agency's green lights* [disertasi]. University of Colorado, Colorado.

Mc Peak, C., & Dai, Q. D. (2011). Environmental issues as a part of sustainability and how they impact financial performance. *Journal of global business issues, 5(2), 49*.

Noh, Y. (2012). *The Effect of Environmental Management on U.S. Public Firms Financial Performance and Equity Structure: A Longitudinal Analysis Using ISO14001* [dissertation]. University of Nebraska, Lincoln (US).

Nuraini, E., & Kawedar, W. (2011). *Pengaruh environmental performance dan environmental disclosure terhadap economic performance*. Universitas Diponegoro. Semarang

Oeyono, J., Samy, M., & Bampton, R. (2011). An examination of corporate social responsibility and financial performance A study of the top 50 Indonesian listed corporations. *Journal of Global Responsibility, 2(1), 100-112*.

OHSAS 18001. (2007). O*ccupational health safety assessment series.* – Requirements with Guidance for Use. ISO/TC.

Peiris, D., & Evans, J. (2010). The relationship between environmental social governance factors and U.S. stock performance. *Journal of Investing*, 19 (3), 104 ; ABI/INFORM.

Peraturan Bank Indonesia nomor 6/10/PBI/2004 tanggal 12 April 2004 serta ketentuan pelaksanaanya sesuai surat Edaran Bank Indonesia No.6/23/DPNP tanggal 31 Mei 2004.

Peters, R. C. (2007). C*orporate social responsibility and strategic performance realizing a competitive advantage through corporate social reputation and astakeholder network approach* [dissertation]. Florida Atlantic University, Boca Raton Florida.

Porter, M. E. (1990). The Competitive Advantage of Nations. Free Press.

Porter, M. E, & Van der ,Linde. C. (1995). Toward a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives,* 9, 97-118.

Pusat Data Tenaga Kerja. 2013. Setahun, 1.965 Nyawa Buruh Melayang. *http://pusdatinaker.balitfo.depnakertrans.go.id*

Robson, L. S., Clarke, J. A, Cullen, K., Bielecky, A., Severin, C., Bigelow, P. L., Irvin, E., Culyer, A.,....& Mahood, Q. (2006). The effectiveness of occupational health and safety management system interventions: a systematic review. *Safety Science*, 45, 329-353.

Rowley, L. S. (2009). *The impact of executive leadership practices on organizational safety performance* [dissertation]. Scool of Business & Technology. Capella University.

Santos, G., Mendes, F., & Barbosa, J. (2011). Certification and integration of management systems: the experience of Portuguese small and medium enterprises. *Journal of Cleaner Production,* 19, 1965-1974.

Sudaryanto. (2011). *Pengaruh Kinerja Lingkungan Terhadap Kinerja Finansial Perusahaan dengan Corporate Social Responsibility (CSR) Disclosure Sebagai Variabel Intervening* [Skripsi]. Fakultas Ekonomi, Universitas Diponegoro, Semarang.

Srivastava, R., Shervani, T. A., & Fahey, L. (1998). Market-based assets and share holder value: a framework for analysis. Journal of Marketing, 62(1).

Stanwick, S. D., & Stanwick, P. A. (2000). The relationship between environmental disclosures and financial performance: an empirical study of US firms. *Eco-Management and Auditing,* 7(4),155. ABI/INFORM Complete .

Schneider, T. E. (2008). *Is there a relation between the cost of debt and environmental performance? An empirical investigation of the US Pulp and Paper Industry, 1994-2005*[dissertation]. University of Warteloo, Canada.

Siah, H. A. (2009). Building intangible resources: the stickiness of reputation. *Corporate Reputation Review*, 12(1), 21-32.

Suk, T. H. (2008). *Explaining environmental performance of Korean Firms: Why some do better than others?* [disertasi]. Graduate School of Indiana University, Blooming Town (US).

Velde, E., Vermeir, W., & Corten, F. (2005). Finance and accounting: Corporate social responsibility and financial performance .*Corporate Governance,* 5(3), 129, ABI/INFORM Complete.

Wallace, J. C. (2004). *A multilevel examination of occupational safety: regulatory focus as an explanatory link between climate, conscientiousness, and performance* [dissertation]. Georgia Institute of Technology.

Watson, K., Klingenberg, B., Polito, T., & Geurts, T. G. (2004). Impact of environmental management system implementation on financial performance. *Management of Environmental Quality*, 15(6), 622, ABI/INFORM Complete.Wingard, H. C, & Voster, Q. (2001). Financial performance of environmentally responsilble South African listed companies. *Meditari Accountancy Research*, 9, 313-332.

www.menlh.go.id/penegakan hukum/?. 2013. Jumlah kasus pencemaran lingkungan.

Young, S. D. (2000). *The Effects of customer loyalty on profitability* [dissertation]. Sain Louis University, Missouri.

Zhao, J. (2006). *The Effect of the ISO 14001 environmental management system on corporate financial performance*. [dissertation]. Graduate School of Maharishi University of Management.