

Strategic Traits of Management System Standards on Business Performance: A Second-Order Structural Equation Modeling

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ABSTRACT: Management System Standards (MSS) widely known in the manufacturing industry that is implementing for performance sustainability. MSS standards have more effects with standards such as ISO9001, OHSAS18001, and ISO14001 to analyze the evolution of the implementation and integration for sustainability. A structural equation modeling (SEM) is provided two phenomena are PLS-SEM and CB-SEM. Although each method has benefits and limitations, in this research it focuses on CB-SEM with AMOS to demonstrate CFA to use in executing the dimensions confirmatory relationships between MSS standards and business performance. CB-SEM is applied to the responses of organizations to a physical survey data executed to test the measurement model. Findings – from the results, the research model of the adaptation of MSS standards integration that has a statistically positive effect on sustainability on business performance. A second-order model related to understanding the level of theory enhanced with the effect of dimensions integration on the constructs achieved in the participating organizations.

KEYWORDS: MSS Standards, Business Performance, and Structural Equation Modeling (SEM)

I. INTRODUCTION

A strategy for the integrated management system of Quality, Environment, Health, and Safety standards are proposed to improve the adoption and implementation of management system standards program in the ready-made-garment manufacturing industries (Muhamad Khair, Lee, Mokhtar, & Goh, 2018).

II. Background of the Study

Nowadays, the globalization era has changed the business environment not only the quality products or services but it has upgraded how products or services are executed through proper channel taking of its related to products or services. It has become more competitive to adopt the green market to shield the human and environment. However, it is more challenges particularly in developing countries that green strategy still has an absence compared to developed countries.

III. The objective of the Study

The key objective of this study is to test the relationship between management system standards (MSS) have a significant effect on sustainable business performance. Therefore, measuring with three standards of first-order constructs strategic traits of MSS standards on business performance.

IV. Literature Review

In this segment, the literature review has revealed the majority of the latest and pertinent, particularly in the management system standards area.

V. Management System Standards (MSS)

Management system standards are a technique throughout that an organization manages the inter-related components of its business to achieve its objectives. These objectives will communicate several various topics, as well as product or service quality, environmental performance, health and safety within the workplace and further. MSS standards help organizations to interest their performance by stipulating nonstop steps that organizations knowingly implement to realize their goals and objectives and to generate a structural culture that automatically

engages in a method the repetitive cycle of self-evaluation, correction, and improvement of operations and processes through heightened employee awareness and management leadership and commitment (Dahlgaard-Park, 2015). Around the globe, many companies implement a standardized management system, mostly adopting the quality management ISO9001, environmental management ISO14001, and occupational health and safety OHSAS18001 of management systems gain more benefits than the others (To, Lee, & Yu, 2012).

Quality Standards (ISO9001) - Presently, many countries have either comprised ISO9001 or cast-off it as the basis of their national quality certification systems have been conducted to inspect the benefits companies gain from attaining and executing ISO9001 standards (M. M. Islam, Karim, & Habes, 2015). ISO is boosting the company's productivity for a longer period. ISO 9001 is possibly the most influential single international MSSs that there has been to date (Heras-Saizarbitoria, 2018). It has to be piercing out that ISO 9001 standard is not standards that refer to compliance with an objective or with a particular result. ISO 9001 isn't a performance customary to live the standard of companies' merchandise or services. It is a standard that found the need to structure and validate a whole series of company processes into a series of procedures, and to certificate this implementation. ISO 9001 standardizes procedures, duties, and roles, rather than goals or outcomes (Heras-Saizarbitoria, 2018; M. M. Islam et al., 2015).

Occupational Health & Safety Standards (OHSAS18001) – occupational health and safety standards in developing countries are not properly implementing and workers do not meet the minimum standards and guidelines set by international agencies such as Bangladesh particularly in ready-made-garments manufacturing sectors (LaDou, 2003). However, it's going to consequence in high activity health and safety services demand, which could be arduous to fulfill by developing countries that area unit ranking economic enlargement while not esteem to their influence on occupational health and safety standards (Mrema, Ngowi, & Mamuya, 2015). Therefore, it is very much effective for the employee's protection during the working areas. The OHSAS18001 standard is currently the most broadly implemented management systems for occupational health and safety globally because the standard is planned to support companies in achieving a higher health and safety standard (Madsen, Kirkegaard, Hasle, & Dyreborg, 2019; Muhamad Khair et al., 2018). Therefore, OHSAS is necessary for an individual to evade dangerous circumstances every day. Also, an organization is subject to legal necessities for the health and safety of individuals inside and around the immediate workplace, or who are bared to the workplace activities (Davaadorj & Koshijima, 2016).

Environmental Standards (ISO14001) - ISO 14001 is an International Standard of worldwide acceptance based on the conception that better environmental performance can be accomplished when environmental features are systematically acknowledged and managed to give a key contribution to sustainability, through pollution prevention, improved environmental enactment and obeying with applicable law (da Fonseca, 2015; Heras-Saizarbitoria, 2018). The process of international standards started to implement ISO 14001 environmental management standards since 1996. A facility to adopt ISO 14001 was associated with lower emissions for the longer a facility operated under ISO 14001 (Russo, 2009). Lean Environmental Management Integration System (LEMIS) is integrating and leads to the formation of measurement standards for assessing the organization, making its environmental efforts more accurate, attentive and achievable (Puvanasvaran, Tian, & Vasu, 2014).

VI. Business Performance

Through the role of business, environments are in terms of competitive performance and non-financial performance as possible factors that touch the effectiveness of invention strategies in providing business performance (Prajogo, 2016). However, the capability to fast and successfully move into new business models is a significant source of sustainable competitive advantage and a key influence to improve the sustainability performance of businesses (Geissdoerfer, Vladimirova, & Evans, 2018).

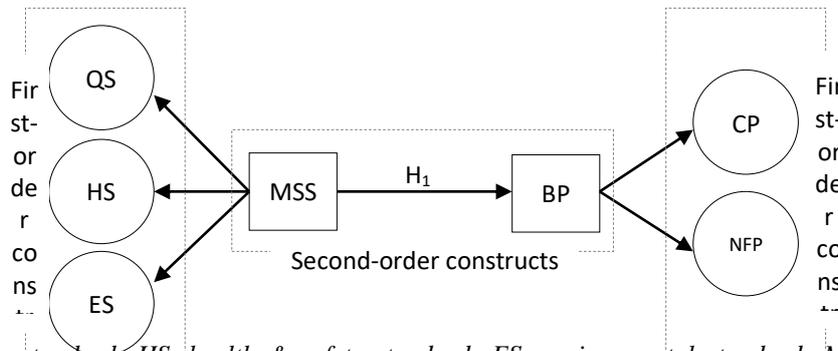
Competitive Performance - In business, competitive performance introduces an entirely new way of accepting what an organization does financials of the resource-based assessment of competitive and mixes existing viewpoints into firm performance (Peteraf, 1993; Porter, 1998). However, social responsibility in a firm performance has been examined as an essential measure of business performance, that takes strategy from a wide-ranging prophecy within the consistent outside of activities (Porter, 1998; Saeidi, Sofian, Saeidi, & Saeidi, 2015). Therefore, Its powerful context delivers the tools to realize the drivers of cost and a business's comparative cost position that allow organizations to sustain longer performance over time (Porter, 1998; Wilden, Gudergan, Nielsen, & Lings, 2013).

Non-Financial Performance - The management system standards (MSS) implemented widely that competitive advantage is directly interrelated to two non-financial events, namely quality performance and external business performance that is straight and significantly impact by three standards of ISO9001, ISO14001, and OHSAS18001 certification (M. Islam, Karim, & Habes, 2015). Therefore non-financial performance procedures are reflective in the dimensional process that creates the implementation of this standard more actively emphasized nonfinancial elements to increase the business performance, which is support mostly by the working environment (Hornungová, 2017; M. Islam et al., 2015).

VII. Hypothesis Relationship & Conceptual Framework

Management System Standards (MSS) have a significant and strong relationship with Business Performance (BP) for longer enhancement. Therefore in this study the core hypothesis of an association between MSS → BP. In this study, the following conceptual framework has drawn through the hypothesis relationship of second-order modeling that is confirmed the theory. Therefore, the conceptual model has explored first-order with three constructs namely ISO9001, OHSAS18001, and ISO14001 that are traits of management system standards (MSS) and first-order with two constructs are competitiveness or financial performance and non-financial performance that traits of business performance. However, the following framework, management system standards displayed as an exogenous variable and business performance as an endogenous variable.

Figure 1: The conceptual Framework



Note: QS=quality standard; HS=health & safety standard; ES=environmental standard; MSS=management system standards; BP=business performance; CP=competitive performance; NFP=non-financial performance

VIII. Research Methodology

In this research, the technique has used positivism with the mono method of the covariance-based structural equation model (CB-SEM) to test the conceptual model.

IX. Sampling and Population

Sampling technique is a methodology that enables researchers to infer evidence a few populations supported results from a subgroup of the population, while not having to examine each individual (Sarstedt, Bengart, Shaltoni, & Lehmann, 2018). There are numerous unlike sampling techniques presented, and that they are segmented into two clusters of samplings: probability and non-probability (Bornstein, Jager, & Putnick, 2013). However, probability sampling systems incline to be more time-consuming and costly than non-probability sampling. There are four major sampling approaches in probability sampling those are: simple random, systematic, stratified, and cluster sampling (Sarstedt et al., 2018).

Random sampling is a portion of the sampling methodology therein every sample has an associate in the nursing equal chance of being chosen. A sample chosen randomly is supposed to be an unbiased illustration of the full population. If for a few reasons, the sample does not represent the population, the variation is termed a sampling error (Patten, Galvan, Patten, & Galvan, 2019). However, cluster sampling was adopted in this study that ensures every group has presented from the target population.

Data Process Management

Data process management is a systematic procedure before the execution of any statistical analysis. Data analysis methods were explored in this study at the very beginning executed by SPSS for the descriptive analysis and exploratory factor analysis. After that, data analysis of hypothesis model estimates of confirmatory factor analysis and structural model through AMOS software. EFA is identified as the internal factor loadings of each measured variable that make sure data is reliable before running in further analysis.

Structural Equation Model (SEM)

Structural equation modeling (SEM) is progressively a technique of choice for the idea and theory expansion in the social sciences, particularly the management discipline(Hair, Gabriel, & Patel, 2014). In management research, there increasingly is essential to measure complex multiple latent constructs of relationships. However, second-order constructs can be displayedthat providing a better theoretical understanding of associations to examine the complex relations among multiple constructs(Hair et al., 2014; Yuan, Chan, Marcoulides, & Bentler, 2016). Subsequently, there are two most widespread SEM-based analytical procedures are covariance-based SEM (CB-SEM) and variance-based SEM (PLS-SEM)(Hair et al., 2014).

Data Analysis

In this section, data has explored through descriptive statistics to hypothesis tests. The following sections have executed statistical tests accordingly.

Descriptive Statistics

The following table explored the descriptive statistics for the respondent’s gender and different department.A total of 261 respondents were male and female with three departments in quality control, accountant, and compliance. Male respondents were highest in total 189 where the accountant is 74 and then compliance and quality control accordingly. On the other hand, female respondents are 72, where the highest number of the respondent is also an accountant. Nevertheless, compliance is second highest but quality controls are less than among gender.

Table 1: Gender and Department Cross-tabulation

| Count | | Department | | | Total |
|--------|--------|-----------------|------------|------------|-------|
| | | Quality Control | Accountant | Compliance | |
| Gender | male | 56 | 74 | 59 | 189 |
| | female | 3 | 48 | 21 | 72 |
| Total | | 59 | 122 | 80 | 261 |

Internal Consistency Measurement

In statistics, internal consistency is typically a measure based on the correlation between different items on the same test(Hair et al., 2014). It measures whether measured items are valid and reliable. However, reliability produces each measured item is confirmed to go in a further test. The following table has displayed in a total of 25 measured variables from five latent constructs which have confirmed all items are valid and reliable from the above cut-off point of 0.70(Cho & Kim, 2015; Cronbach & Meehl, 1955). Therefore, Cronbach’s alpha achieved more than a desirable value. At the mean and standards deviation are also achieved sturdily.

Table 2: Reliability and validity outputs item-total statistics

| N=261 | μ | σ | Corrected item-total correlation | Cronbach’s alpha | No. of items |
|-------|-------|----------|----------------------------------|------------------|--------------|
| QS1 | 4.24 | 0.799 | 0.761 | 0.89 | 5 |
| QS2 | 4.33 | 0.864 | 0.821 | 0.87 | |
| QS3 | 4.07 | 0.909 | 0.760 | 0.89 | |
| QS4 | 4.26 | 0.878 | 0.806 | 0.88 | |
| QS5 | 4.21 | 0.917 | 0.709 | 0.90 | |
| HS1 | 4.28 | 0.804 | 0.756 | 0.88 | 5 |
| HS2 | 4.28 | 0.795 | 0.836 | 0.86 | |
| HS3 | 4.25 | 0.773 | 0.819 | 0.87 | |
| HS4 | 4.19 | 0.847 | 0.753 | 0.88 | |

| | | | | | | |
|------|------|-------|-------|------|------|---|
| HS5 | 4.25 | 0.852 | 0.653 | 0.91 | | |
| ES1 | 4.14 | 0.897 | 0.856 | 0.93 | | |
| ES2 | 4.29 | 0.992 | 0.808 | 0.94 | | |
| ES3 | 4.23 | 0.973 | 0.866 | 0.92 | | |
| ES4 | 4.26 | 0.953 | 0.870 | 0.93 | | |
| ES5 | 4.19 | 0.958 | 0.840 | 0.93 | 0.94 | 5 |
| CP1 | 3.93 | 0.894 | 0.631 | 0.91 | | |
| CP2 | 4.07 | 0.849 | 0.822 | 0.88 | | |
| CP3 | 4.15 | 0.841 | 0.850 | 0.87 | | |
| CP4 | 4.21 | 0.835 | 0.813 | 0.88 | | |
| CP5 | 4.09 | 0.905 | 0.747 | 0.89 | 0.91 | 5 |
| NFP1 | 3.93 | 0.892 | 0.619 | 0.92 | | |
| NFP2 | 4.07 | 0.864 | 0.819 | 0.87 | | |
| NFP3 | 4.16 | 0.838 | 0.856 | 0.87 | | |
| NFP4 | 4.21 | 0.835 | 0.811 | 0.88 | | |
| NFP5 | 4.09 | 0.909 | 0.743 | 0.89 | 0.90 | 5 |

Exploratory Factor Analysis (EFA)

Exploratory factor analysis (EFA) is an exceptionally common technique for decisive the underlying subject structure for a group of variables(Hair et al., 2014).EFA is notorious for being conducted with tiny sample sizes, where the minimum required sample size should be a hundred (McNeish, 2017). EFA could be delineated as an orderlyrationalization of reticular measures. EFA usually has been wont to explore the doable underlying issue structure of a group of discovered variables while not imposing a hard and fast structure on the result (Suhr, 2006). In EFA, data is solely explored and provides evidence regarding the number of factors essential to represent the data altogether measured variables that are associated with each latent variable(Solutions, 2016). Nevertheless, EFA has identified the measurement scales are executable for the next procedure of confirmatory factor analysis(Hair et al., 2014). The following table explored the total-item without any cross-connection among measured variables and all items have reached of factor loadings above 0.50. Therefore, the EFA matrix eloquent of each measured variable explored to go in the next statistical test of confirmatory factor analysis (CFA).

Table 3: EFA of rotated component matrix

| | Component | | | | |
|------|-----------|-----|-----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 |
| QS1 | .75 | | | | |
| QS2 | .78 | | | | |
| QS3 | .82 | | | | |
| QS4 | .73 | | | | |
| QS5 | .80 | | | | |
| HS1 | | .82 | | | |
| HS2 | | .89 | | | |
| HS3 | | .86 | | | |
| HS4 | | .81 | | | |
| HS5 | | .71 | | | |
| ES1 | | | .83 | | |
| ES2 | | | .80 | | |
| ES3 | | | .84 | | |
| ES4 | | | .83 | | |
| ES5 | | | .85 | | |
| CP1 | | | | .72 | |
| CP2 | | | | .85 | |
| CP3 | | | | .87 | |
| CP4 | | | | .85 | |
| CP5 | | | | .82 | |
| NFP1 | | | | | .71 |
| NFP2 | | | | | .88 |
| NFP3 | | | | | .90 |
| NFP4 | | | | | .87 |
| NFP5 | | | | | .81 |

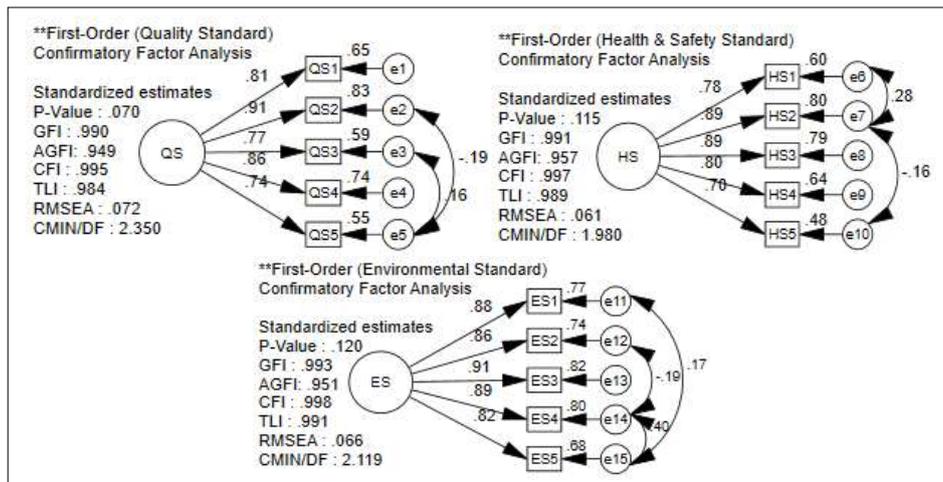
| | |
|--|-------------|
| Kaiser-Meyer-Olkin (KMO) Measure of sampling adequacy | .902 |
| Bartlett's test of Sphericity significance <0.001 | .000 |

***Extraction method: principal component analysis (PCA)
 Rotation method: varimax with Kaiser Normalization.

X. Confirmatory Factor Analysis (CFA)

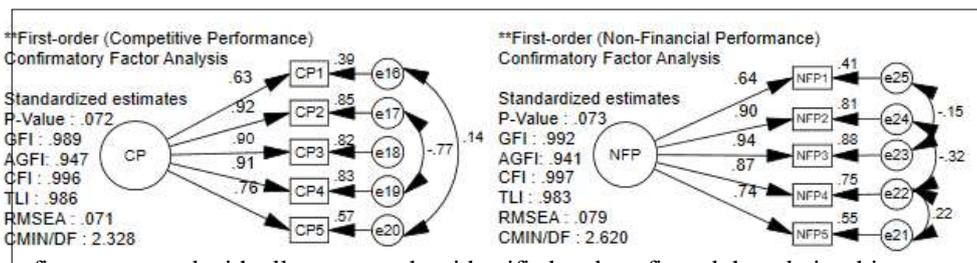
Confirmatory factor analysis (CFA) is a numerical technique that wants to make sure the issue structure of a group of discovered variables(Hair et al., 2014). CFA permits scientists to check the hypothesis that a relationship between discovered variables and their underlying latent constructs exists(Suhr, 2006).CFA is a multivariate numericalmethod that is analyzed to examine how well the measured variables represent the number of constructs and thus CFA could be a tool that is to confirm or reject the measure theory(Solutions, 2016).The following figure has shown about three latent first-order constructs trait of MSS standards p-values insignificant have achieved and confirmed with the goodness of fit model. The goodness of fit parameter of quality standards (QS), health & safety standard (HS), and environmental standards (ES) standardized estimates are GFI, AGFI, CFI, TLI, RMSEA, and CMIN/DF have achieved greater than the desired value. Therefore, the value of GFI, CFI, and TLI has achieved >0.95 of MSS standards three first-orders constructs(Hair et al., 2014). However, AGFI is also reached >0.80 and RMSEA is <0.08 and the chi-square degree of freedom (CMIN/DF) is <5.0 accordingly(Hair et al., 2014). So, it concludes that first-order constructs trait of MSS standards has confirmed with measured variables are insignificant with the goodness of fit model.

Figure 2: First-order constructs trait of MSS standards



Now move on the first-order constructs competitive performance (CP) and non-financial performance (NFP) trait of business performance in the following figure executed and p-values are >0.05 that is insignificant and models have become goodness of fit as well. However, both models are the goodness of fit parameters that have achieved within desirable values consequently. Therefore, the value of GFI, CFI, and TLI are >0.95 where the cut-off point is ≥0.90. The value of RMSEA and CMIN/DF are <0.08 and <5.0 respectively(Hair et al., 2014).

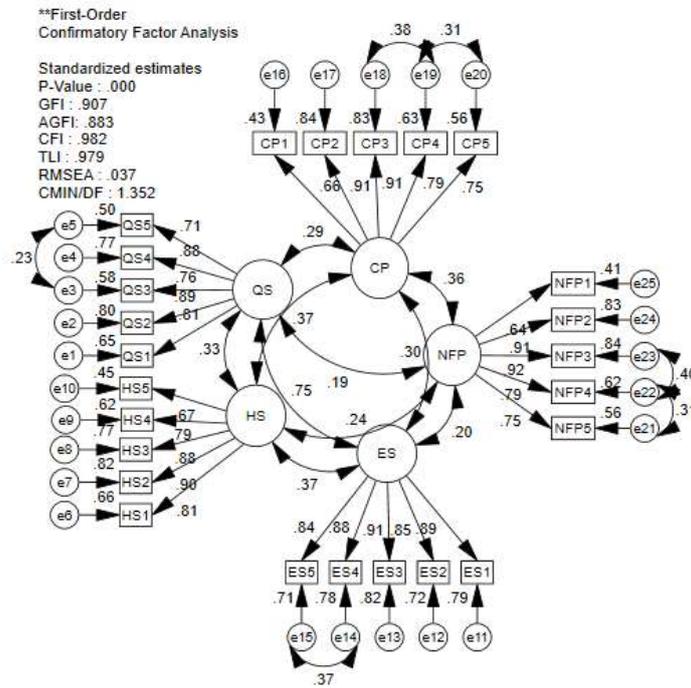
Figure 3: First-order constructs trait of business performance



The following figure executed with all constructs has identified and confirmed the relationships among them and the p-values are achieved <0.05 that is significant and models have become goodness of fit as well thus in CFA p-value should be <0.50 (Hair et al., 2014). Subsequently, the value of GFI is 0.907, CFI is 0.982, and TLI is 0.979

where the desirable point is ≥ 0.90 and the value of RMSEA is 0.037 and CMIN/DF is 1.352 where desirable values are < 0.08 and < 5.0 respectively (Hair et al., 2014).

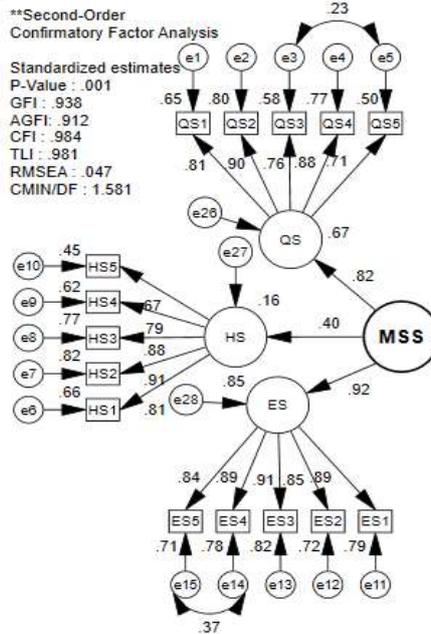
Figure 4: First-order CFA of all constructs



Nevertheless, the above figure of CFA first-order constructs have accumulated and confirmed that constructs have achieved parameters through analytical data manipulation at the level of the goodness of fit. Therefore, CFA of first-order has identified to go in further analysis to test the dimensions of second-order CFA analysis to test the conceptual model individually.

The following figure shows the second-order confirmatory factor analysis (CFA) of MSS standards with widely implemented around the globe.

Figure 5: Second-order CFA of MSS constructs



The above parameters have provided above desirable values that are GFI, CFI, TLI, AGFI statistically significant through the value of RMSEA is 0.047 and CMIN/DF is 1.581 which less than 0.08 and less than 5 accordingly. Therefore, the second-order of MSS standards have identified to confirm by measuring three dimensions.

Subsequently, the following table has provided the output of MSS standards the second-order where critical ratio (C.R.) measured by predicting between MSS standards and quality standard is 6.43 and p-value is 0.000 that is greater than 1.96 path relations at significant of p-value ≤ 0.05 (Hair et al., 2014). The regression weight between health and safety with MSS standards also supported where C.R. is 5.12 and the p-value is .000, which C.R. is >1.96 and the p-value is <0.001 . Moreover, regression weight between MSS standards and environmental standards also supported where the regression weight of reference in the AMOS is required to run the analytical analysis.

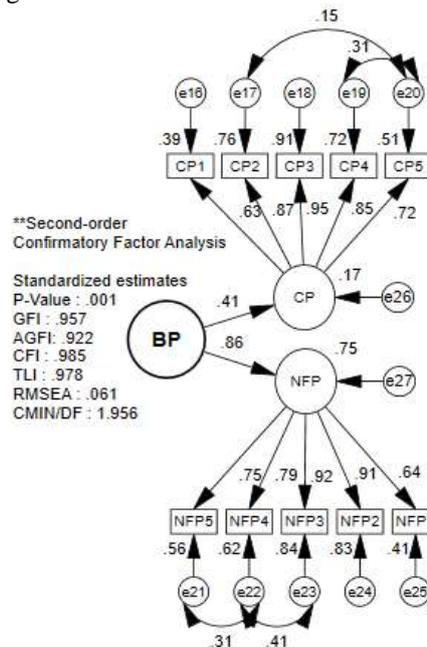
Table 4: Second-order CFA standardized regression weights for MSS

| Path structural relationships | Estimate | S.E | C.R | P | Remark |
|-------------------------------|----------|---------------------------------------|------|-----|----------|
| QS <--- MSS | 0.82 | 0.121 | 6.43 | *** | Accepted |
| ES <--- MSS | 0.92 | <i>Regression weight of reference</i> | | | |
| HS <--- MSS | 0.40 | .070 | 5.12 | *** | Accepted |

***means the significant level at p-value less than 0.001

The following figure shows the second-order confirmatory factor analysis (CFA) of business performance (BP) with two dimensions of competitive performance and non-financial performance. However, the parameters have provided above desirable values that are GFI, CFI, TLI, AGFI statistically significant through the value of RMSEA is 0.061 and CMIN/DF is 1.956 which less than 0.08 and the below 5.0 accordingly. Therefore, the second-order of BP construct has identified to confirm by measuring by two dimensions accordingly.

Figure 6: Second-order CFA of BP constructs



The following table of the path-coefficient of the business performance predicting by two dimensions has supported by measured items where C.R. value is 5.06 and the p-value is 0.000 which is >1.96 and the p-value is <0.001 .

Table 5: Second-order CFA standardized regression weights for BS

| Path structural relationships | Estimate | S.E | C.R | P | Remark |
|-------------------------------|----------|---------------------------------------|------|-----|----------|
| CP <--- BP | 0.86 | .022 | 5.06 | *** | Accepted |
| NFP <--- BP | 0.41 | <i>Regression weight of reference</i> | | | |

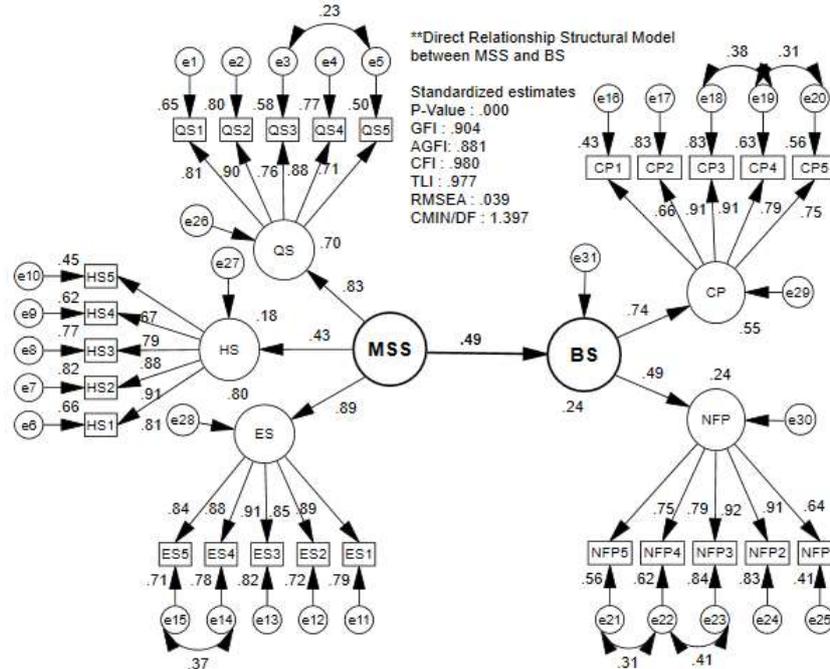
***means the significant level at p-value less than 0.001

Therefore, CFA analysis has confirmed to go to structural equation modeling (SEM) of the path analysis to test the hypothesis of the research conceptual model that was generated through literature.

XI. Structural Equation Modeling

The structural equation modeling (SEM) is to use to perform developing the theory or to test the theory in the social sciences, which have two phenomena, one is called covariance-based structural modeling (CB-SEM) and variance-based or partial least square structural equation modeling (VB/PLS-SEM) (Hair et al., 2014). However, the following figure of the hypothesized model executed through AMOS statistical software and goodness of fit parameters have displayed with the desired value. The value of GFI is .904, CFI is .980, TLI is .977, which is >.90. the model fit value of AGFI is .881, which is >.80 and RMSEA is .039 and CMIN/DF is 1.397, which is less than .08 and below 5 with the p-value is less than .000 that is <.001 (Hair et al., 2014).

Figure 7: SEM of the hypothesized conceptual model



Nevertheless, the following table shows the critical ratio (C.R.) between constructs to dimensions where all of the C.R. with the entire dimensions have accepted by it's the cut-off value greater than of 1.96 and p is below than .05. However, the hypothesis of second-order H1 has accepted by C.R. and significant value, where C.R. is 4.98 with the p-value is less than .001 between MSS standards and business performance(Hair et al., 2014).

Table 6: Hypothesized SEM model standardized regression weights

| Path structural relationships | Estimate | S.E | C.R | P | Remark |
|-------------------------------|----------|---------------------------------------|------|-----|----------|
| BP<--- MSS | 0.49 | 0.071 | 4.98 | *** | Accepted |
| QS<--- MSS | 0.83 | 0.099 | 8.29 | *** | Accepted |
| HS<--- MSS | 0.43 | 0.067 | 5.82 | *** | Accepted |
| ES<--- MSS | 0.89 | <i>Regression weight of reference</i> | | | |
| CP <--- BP | 0.74 | <i>Regression weight of reference</i> | | | |
| NFP <--- BP | 0.49 | 0.196 | 3.35 | *** | Accepted |

***means the significant level at p-value less than 0.001

XII. Conclusion & Recommendation

Increasing the world competition of manufacturing industries has become more corporate agenda difficulties to adopt environment safe and reliable by it's internally and externally. However, the sustainable strategy is a vital issue to grow competitiveness and to ensure Business performance. Therefore, this strategy is different than technology innovation, where social responsibility developed through the working environment with occupational health and safety standard within companies. The effects of constructs are implemented and it displayed second-order constructs of management systems standards traits of three dimensions are confirmed to measure the goodness fit parameters achieved with the desired value. Nevertheless, the MSS standards have identified by three dimensions that influence business performance. The dependent variable of business performance is confirmed

with two dimensions of competitive performance (CP) and non-financial performance (NFP) identified by survey data analyzed. Therefore, the key hypothesis is indicated the critical ratio with statistically significant relationships between MSS standards and business performance. Subsequently, the overall outputs have acknowledged through theoretically tested from the survey data is statistically confirmed.

Therefore, CFA provided the literature associated with check the hypothesis that an affiliation between exposed variables and their underlying latent constructs happens. However, if organizations adopt MSS standards with a minimum of three dimensions of ISO9001, ISO14001, and OHSAS18001 then it impacts business performance sustainability. Limitations are in this research data was collected only one specific industrial zone conducted, even another zone that is the same essential in further exploration. Further research might be significant with moderator variable implementation between MSS standards and business performance to develop the model verifying with partial least square structural equation modeling (PLS-SEM).

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