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Integration of Corporate Social Responsibility for Improved Company Performance: Evidence from the Indonesian Manufacturing Industry

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Abstract. This study aims to investigate how corporate social responsibility (CSR) integration can improve company performance. Using 435 surveyed data from the Indonesian manufacturing industry in Java, this study employed Partial Least Square Structural Equation Modelling (PLS-SEM) to verify the hypotheses. The findings reveal that strategic CSR integration has a significant impact on employee, operational, and financial performances, while functional CSR integration has a substantial effect on customer, employee, operational and financial performances. The results also suggest that strategic CSR integration has a significant effect on functional CSR integration. The findings highlight that, when mediated by functional integration, strategic integration has a greater impact on company performance. The findings can encourage executives to integrate CSR more effectively at the strategic and functional levels in order to obtain better social and financial performances.

Keywords: social responsibility, strategic level, functional integration, operational performance, manufacturing sector, emerging countries

INTRODUCTION

Corporate social responsibility (CSR) is the most frequently used term for highlighting the connection between companies and society [1]. CSR can be defined as the integration of a company's social, environmental, ethical, and philanthropic responsibilities to society into its operations, processes and core business strategy in collaboration with key stakeholders [2]. CSR is considered to be the way in which a company transparently and accountably integrates social, environmental and economic issues into their beliefs, culture, decision-making, strategy and operations, thereby creating best practices within the company, generating wealth and improving society [3]. Thus, a company's CSR should be aligned or integrated into its business strategy and operations to further develop its competitive advantage. Such integration is crucial to enhance companies' social, environmental, and financial performance [4-12]. Many managers agree on a strategic interest in CSR, but few fully incorporate CSR aspects into their business practices. Integrating CSR into a business strategy decision is one of the most challenging tasks facing managers [5].

Furthermore, the majority of CSR studies focus on CSR in developed countries [13]. Because CSR is becoming a distinct topic of management research in developing countries [14], it is critical to understand CSR's contribution and the main factors that influence CSR performance [1, 15, 16]. Therefore, this study aims to investigate the impact of CSR integration on company performance in the context of the Indonesian manufacturing industry. The findings of this study provide a deeper understanding of how CSR can be integrated at the strategic and functional levels and the effect of these integrations on company performance, particularly in the context of developing countries.

The remainder of the paper is organised as follows: the next section discusses the theoretical background and hypotheses development. Then, the methodology is explained, followed by the results and discussion. The last section presents the conclusion, implication, and limitations, as well as suggestions for future research.

THEORETICAL BACKGROUND

CSR reaches a strategic level in organisations as it contributes to the achievement of its strategic objectives [17]. The strategic CSR integration describes how far the company's business strategy embraces CSR at its heart [18]. The first important step in CSR integration is to include the idea of social responsibility in the company's vision and mission [4, 11, 19-21]. Companies with missions and values embedded with CSR are more likely to create a stakeholder-oriented environment that will lead to sustainable competitive advantage [22].

Moreover, top management support ensures the success of CSR programs [23]. Despite this support, CSR programs can be difficult to devise and enforce [23], which can act as critical barriers to CSR implementation [24].

In addition, strategic CSR integration needs an effective communication plan to promote CSR activities and to generate a clear understanding that CSR is an aspect of strategic importance to the company [19, 25-27]. There should be transparent communication, both internally and externally, which contributes positively to the fulfilment of the company's objectives and is an essential part in the integration process of corporate sustainability [28].

CSR Integration at the Functional Level

The development of CSR activities is determined by how well they are integrated into current company operations [6, 29]. As suggested by Asif et al. [30], vertical integration of CSR is conducted by transforming organisational objectives into operational and tactical imperatives. Thus, after integrating CSR at the strategic level, the next dimension is integrating the companies' social concerns into their business activities and operations [19, 31]. Functional integration can be defined as the extent to which a company makes use of interactions with other intra-organisational units to make its program objectives and practices consistent with its internal and external requirements [32]. In this integration, the company identifies its position regarding responsible business practices and establishes the effectiveness of its activities [33].

Quality, low cost, production flexibility and delivery performance are four competitive criteria in the manufacturing sector [34-36]. Besides, quality and innovation should be considered in the integration of corporate sustainability into strategic management [28, 37, 38]. Moreover, socially responsible companies broaden their activities of CSR to include managing their partners in the supply chain [39], such as suppliers and customers [40]. Human resource management is also critical in the integration process [19] and often part of CSR strategy [17].

CSR and Company Performance

An increasing body of scholarly literature has grown around the relationship between CSR and company performance [13, 41-45]. For instance, several studies highlight that CSR has a positive effect on financial performance [13, 43, 46]. Prior studies also found that CSR has a positive impact on customer performance [34, 47, 48], employee performance [11, 12, 49, 50], and operational performance [12, 51, 52].

From a CSR perspective, evaluations of businesses' impacts on society have to consider both the financial and social value created by companies [29]. Particularly, regarding CSR integration, it is wise and sensible for business decision makers to initiate or carry out CSR activities and practices that address not only social and environmental concerns, but also economic concerns for their organisations [22]. In this study, company performance represents the result of integration between CSR and the business strategy, and as such, will be measured across four aspects: customer, employee, operational and financial performances. Accordingly, we suggest:

- H1. Strategic CSR integration has a positive impact on (1a) customer performance, (1b) employee performance, (1c) operational performance and (1d) financial performance.
- H2. Functional CSR integration has a positive impact on (2a) customer performance, (2b) employee performance, (2c) operational performance and (2d) financial performance.

Strategic integration describes how the company integrates CSR into its business strategy at the strategic level. This integration is implemented for the long term and guides activities at the functional level. It then influences decisions on the development of CSR practices [19]. Thus, the stages of CSR integration can occur sequentially, and a further stage can be conducted if the previous stage has been completed [19, 20, 33]. Therefore, we suggest:

H3. Strategic CSR integration has a positive relationship with functional CSR integration.

METHODOLOGY

This study used a quantitative research approach with a survey method via mail, personal delivery, and online. From 1,055 questionnaires distributed, 514 questionnaires were returned. After data screening, 435 responses remained in the data set, used in this paper. Moreover, Statistical Package for the Social Sciences (SPSS) 26 and SmartPLS 3, a professional software of Partial Least Square Structural Equation Modelling (PLS-SEM), were employed for the statistical analyses to check the proposed hypotheses.

Measurement of Strategic Integration

Table 1 displays the 15 items of strategic integration, modified from quantitative studies [32, 53-55] and qualitative studies [11, 19, 21, 24, 56]. The respondents were asked to show how they agree or disagree with each statement of strategic integration activities using a five-point scale from 1='strongly disagree' to 5='strongly agree'.

 TABLE 1. Measurement Items of Strategic Integration

	Construct and indicator	Loading	AVE	Cronbach's alpha
	Strategic Integration (Strat_Int)		0.62	0.96
SI01	CSR is one of the main long-term goals.	0.74		
SI02	Objectives relate to social and environmental aspects.	0.75		
SI03	Mechanisms are available to evaluate the objectives' results.	0.63		
SI04	Aligning of CSR strategy with corporate vision and mission.	0.81		
SI05	Continuous improvement and/or preventive actions in the	0.82		
	area of CSR.			
SI06	Top management defines a clear vision and core corporate	0.82		
	values relating to CSR.			
SI07	Top management remains responsive to the CSR issues.	0.83		
SI08	Top management provides mentoring and coaching.	0.78		
SI09	CSR efforts are systematically organized.	0.86		
SI10	Regular team meeting to discuss CSR.	0.81		
SI11	CSR strategies and goals communication to the employees.	0.82		
SI12	Internet and social networks to communicate CSR.	0.77		
SI13	CSR communication within the company.	0.79		
SI14	CSR report is available.	0.82		
SI15	CSR information is provided on the company's web.	0.76		

Measurement of Functional Integration

Measurement items of functional integration were adopted from previous studies on strategic management, CSR, and manufacturing, such as Chi, T. [34], Kotha and Vadlamani (1995), Kun, L., Nasrin, R.K. [57], Reverte, C., Gómez-Melero, E. [55], Ward, P.T., Duray, R. [35] and Xie, X., Jia, Y. [58]. The respondents indicated their responses with a five-point scale from 1='strongly disagree' to 5='strongly agree'. Table 2 presents 17 items out of 30 items as a result of the measurement model assessment with SmartPLS.

TABLE 2. Measurement Items of Functional Integration

	Construct and indicator	Loading	AVE	Cronbach's alpha	R ² value	Q ² value
	Functional integration (Func_Int)		0.50	0.94	0.28	0.13
FI04	Increasing labour productivity.	0.62				
FI09	Producing high-quality products.	0.68				
FI10	Innovations and improvements.	0.70				
FI11	Reducing defective rates.	0.71				
FI12	Improving product performance and reliability.	0.72				
FI13	Quality control circles.	0.72				
FI14	Products satisfy national and/or	0.72				

	international quality standards.		
FI15	Strict product quality control	0.75	
	procedures.		
FI16	Treating suppliers fairly and	0.69	
	respectfully.		
FI20	Stable relationships with the suppliers.	0.69	
FI21	Accurate and complete information	0.71	
	about our products.		
FI22	A prompt response to the customers'	0.71	
	complaints.		
FI23	Incorporating the interests of	0.72	
	customers in business decisions.		
FI25	Honesty in products sale or	0.72	
	promotion.		
FI26	Health and safety for the employees.	0.70	
FI27	Treating the employees fairly and	0.73	
	respectfully.		
FI29	Properly and fairly salary for the	0.72	
	employees.		

Measurement of Company Performance

Table 3 shows the measurement of company performance with 14 items, adopted from the strategic management, manufacturing, and CSR literature. Respondents were asked to rate their company's performance relative to their competitors over the recent three-year period. A five-point-scale was used to rate the respondents' responses from 1='much longer/much worse/much lower' to 5='much shorter/ much better/much higher'.

TABLE 3. Measurement Items of Company Performance

-	Construct and indicator	Loading	AVE	Cronbach's alpha	R ² value	Q ² value
	Customer performance (Cus)		0.73	0.81	0.23	0.16
CP12	Customer satisfaction.	0.89				
CP13	Customer loyalty.	0.86				
CP14	Increasing number of consumers.	0.81				
I	Employee performance (Emp)		0.72	0.81	0.43	0.30
CP04	Employee training.	0.85				
CP05	Career opportunities.	0.86				
CP15	Employee motivation.	0.83				
	Financial performance (Fin)		0.67	0.83	0.28	0.18
CP03	Cash flow report.	0.78				
CP08	Profit.	0.85				
CP09	Return on investment (ROI).	0.87				
CP10	Sales growth.	0.76				
C	Operational performance (Opr)		0.63	0.81	0.28	0.17
CP01	Timeline of customer service.	0.76				
CP02	Delivery time.	0.78				
CP06	Productivity.	0.82				
CP07	Operational efficiency.	0.82				

Sample and Data Collection

This study used a sample study of manufacturing companies in Java because: (i) 64.29% or 2.8 million Indonesian manufacturing companies are located in Java and (ii) the manufacturing industry in Java contributes considerably to the national GDP with over 70% [59]. The 2017 Manufacturing Industrial Directory [60] served as the sampling framework with an organisation as the unit of analysis. The survey contained 33 groupings of the Indonesian Standard Industrial Classification and encompassed five regions in Java (East Java, Central Java, Yogyakarta, West Java, and Jakarta).

A survey using a questionnaire as a self-completion method was conducted from June to October 2018 via mail, online and personal delivery. Although 1,055 questionnaires were sent, not all of them were returned. Several potential respondents indicated they could not participate because they were either too busy or could not provide the essential information. Overall, 514 questionnaires were returned, yielding a response rate of 48.72%. Data screening was conducted in four steps: checking conformity with the sample criteria, missing data testing, outlier identification and data normality evaluation. After data screening, 435 responses remained in the data set, corresponding to a response rate of 41.23%.

RESULTS AND DISCUSSIONS

Descriptive Analysis

In total, the majority of respondents (23.4%) are in top management positions (owner, chief executive officer and director), 57.8% are in managerial positions (senior, middle, and assistant managers), and the remaining 18.9% are team leaders and others. Most respondents had been working more than 10 years (38.6%), less than five years (37.9%), and between six and 10 years (23.4%). The respondents were mainly over 40 (51.5%), under 30 (26%), and between 31 and 40 years old (22.5%).

The top five products of the respondents' companies were food and beverages (26.4%), chemicals and pharmaceutical goods (11%), manufactured metal goods (9.7%), rubber and plastic products (8%) and textile products (6.7%). Most respondents' companies (68.3%) are large companies, followed by medium companies (21.6%), and small companies (10.1%). Almost half of the respondents' companies (49.2%) have been operating between 21 and 50 years, followed by from five to 20 years (32%), over 50 years (12%) and less than five years (6.8%). The majority of the respondents' companies (74.5%) are located in East Java, 18.9% in Jakarta and West Java, and the remaining 6.7% in Yogyakarta and Central Java.

PLS-SEM Analysis

Figure 1 describes the relationship between strategic and functional integration and company performance. Strategic Integration (Strat_Int) and Functional Integration (Func_Int) are single contructs, while company performance contains four constructs: customer performance (Cus), employee performance (Emp), operational performance (Opr) and financial performance (Fin). It can be seen that Func_Int can be also a mediator in the relationship between Strat Int and the four constructs of company performance.

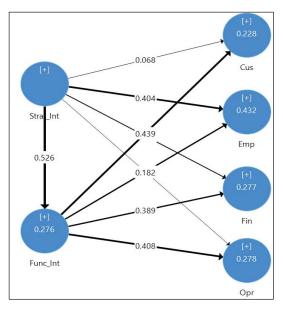


FIGURE 1. Model of CSR Integration and Company Performance

The PLS algorithm was conducted in this study with a path weighting scheme, 500 maximum iterations, and a stop threshold of 7. In the bootstrapping procedure, complete bootstrapping, bias-corrected and accelerated (BCa) bootstrap for confidence interval method, two-tailed testing, and 0.05 significance level were employed that included 5,000 subsamples and 500 observations in the original data.

Assessment of the Measurement Model in CSR Integration

Assessment of the measurement model in this study includes internal consistency reliability (Cronbach's alpha), convergent validity, namely loading and average variant extracted (AVE), and discriminant validity (Fornell-Larcker criterion). Table 1, Table 2, and Table 3 present the results of the measurement model evaluation. After eliminating indicators with loading below 0.6, the results indicate that six constructs have Cronbach's alpha above 0.70 and AVE equal to or more than 0.50. Regarding Fornell-Larcker criterion, the results show that each construct shared more variance with its own measurement items than with the constructs of the different measurement items. Overall, the results reveal that the assessment of measurement models has been achieved satisfactorily.

Assessment of the Structural Model in CSR Integration

The assessment of the structural model contains evaluation of collinearity, coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2) and structural model relationship [61]. The results indicate no significant levels of collinearity detected among the indicators and the constructs in the model because outer and inner variance inflation factor (VIF) values are less than 5. Emp is the most significant predictor of the structural model (R^2 =0.43) (see Table 2). As shown in Table 4, Strat Int has the biggest effect on Funct Int (f^2 =0.38). In contrast, Strat Int has a small effect on Opr (f^2 =0.03) and Fin (f^2 =0.04). Other five paths have medium to large effects. The resulting cross-validated redundancy Q^2 values are positive between 0.13 and 0.30, indicating the significance in the prediction of the constructs [62] (see Table 2 and Table 3).

As presented in Table 4, nine paths have positive and significant direct effects. Strat_Int has the biggest direct effect on Emp (β =0.40), then on Fin (β =0.20), and on Opr (β =0.18). Strat_Int -> Cus has the lowest direct effect (β =0.07); however, this direct effect is insignificant. Based on the results, H1b, H1c and H1d are supported while H1a is not supported.

On the other hand, Func_Int has the greatest direct effect on Cus (β =0.44), then on Opr (β =0.41), and on Fin (β =0.39). Its lowest direct effect lays on Func_Int -> Emp (β =0.35). Thus, H2a, H2b, H2c and H2d are supported. In comparison, the direct effects from Func_Int to four constructs of company performane are bigger than those from Strat Int to company performance.

Interestingly, Strat_Int has a significant direct effect on three performances, while Func_Int has a substantial direct effect on four performances. The results show that CSR integration at functional level provides more benefits, not only for internal stakeholders (employees), but also for external stakeholders, such as customers.

TABLE 4. Direct Effects of CSR Integration

Path	Direct Effect	t value	p value	Total Effect	t value	p value	f² value
Func_Int -> Cus	0.44 [0.32, 0.55]	7.61	0.00	0.44 [0.32, 0.55]	7.61	0.00	0.18
Func_Int -> Emp	0.35 [0.26, 0.43]	8.03	0.00	0.35 [0.26, 0.43]	8.03	0.00	0.15
Func_Int -> Fin	0.39 [0.30, 0.48]	8.69	0.00	0.39 [0.30, 0.48]	8.69	0.00	0.15
Func_Int -> Opr	0.41 [0.31, 0.51]	8.23	0.00	0.41 0.31, 0.51]	8.23	0.00	0.17
Strat_Int -> Cus	0.07 [-0.03, 0.17]	1.30	0.19	0.30 [0.21, 0.39]	6.53	0.00	0.00
Strat_Int -> Emp	0.40 [0.32, 0.49]	9.26	0.00	0.59 [0.53, 0.65]	18.87	0.00	0.21
Strat_Int -> Fin	0.20 [0.11, 0.30]	4.35	0.00	0.41 [0.34, 0.49]	10.74	0.00	0.04
Strat_Int -> Opr	0.18 [0.08, 0.29]	3.41	0.00	0.40 [0.31, 0.48]	9.12	0.00	0.03
Strat_Int -> Func_Int	0.53 [0.46, 0.59]	15.06	0.00	0.53 [0.46, 0.59]	15.06	0.00	0.38

Note: The values in brackets represent the 95% bias-corrected and accelerated confidence interval of the path coefficients obtained by running the bootstrapping routine with 5,000 samples in Smart PLS.

Overall, the results highlight that CSR integration at the strategic and functional level have a significant positive effect on company performance socially and financially. These findings are supported by previous studies, which indicates that CSR would have an immense effect on the perceptions and attitudes of customers towards companies and the goods they manufacture [47]. CSR can increase customer satisfaction [48], decrease customer complaints, enhance customer service, and improve customer loyalty [34]. However, the results show that only functional integration has a significant direct effect on customer performance. As shown in Table 3, several indicators relate to quality, innovation, and customer that provide a big positive impact on customer performance.

In addition to customers, employees are satisfied with and enjoy working for companies with a high commitment to CSR. They tend to be more optimistic, loyal and productive than those who work for employers with lower commitment to CSR [11]. CSR practices also can boost employee loyalty and motivation, which, in turn, helps to maintain high quality employees [12, 50]. More specifically, the findings discover that strategic integration has a bigger direct effect on employee performance than functional integration. It can be assumed that employees are likely to have a positive perception of CSR if it is defined at the strategic level, and then used as guidance for business activities at the lower level.

Notably, integrating CSR activities into the operation process will enable the company's business operations to be performed responsibly [56]. Companies have the opportunity to reduce production costs, increase flexibility and improve the quality and performance of shipments when they involve themselves in CSR initiatives, which impacts on their operational performance in terms of cost, quality, delivery, and flexibility [63]. Both strategic and functional integrations have a substantial effect on operational performance. Because functional integration includes several items related to operations, such as cost, quality, and innovation, it is understandable that functional integration has a greater impact on operational performance than strategic integration.

Likewise, companies have superior financial performance and sustain financial competitiveness if they prioritise CSR activities based on strategic concerns and integrate them into business strategy [10, 64]. The findings of this study show that CSR practices, such as CSR integration, can help companies improving their performance [12, 65].

As shown in Table 4, the biggest direct effect lays on Strat_Int -> Func_Int (0.53). Notably, the total effects from Strat_Int to company performance are greater than its direct effects because of the mediating effect from Func_Int. Thus, H3 is supported. This result suggests that strategic integration can be implemented either separately or sequentially with functional integration because they have positive and significant total effects on company performance. This means that companies could implement functional integration without completing strategic integration. Nonetheless, if they are carried out sequentially, strategic integration has a bigger significant impact on company performance socially and financially.

CONCLUSION, CONTRIBUTION AND LIMITATION

Several conclusions can be drawn based on the findings of this study. First, this study emphasises that strategic and functional CSR integrations have a positive impact on company performance. This study points out that CSR integration should be conducted at the strategic level first as a guidance for business activities in the lower level. By doing so, employees will have a good perception of companies' commitment to CSR. As a result, their performances can be increased. Then, CSR integration is carried out at the functional level that relate to product, quality, innovation, suppliers, customers and employees. Accordingly, functional integration provides a significant effect on four aspects of company performance.

Second, this study highlights a positive relationship between strategic and functional integrations. The findings of this study suggest that strategic and functional integrations can be applied separately or sequentially. However, the findings highlight that strategic integration can have a stronger impact on company performance if it comes first, followed by functional integration. By doing so, the impact of strategic integration on company performance can be mediated by functional integration.

From a theoretical perspective, this study contributes to the literature by developing a framework of CSR integration at the strategic and functional levels. This study enriches the literature by providing a deeper understanding of CSR implementation in developing countries, particularly Indonesia, where the manufacturing industry contributes the most to the national economy. From a practical perspective, the findings of this study have significant managerial implications. The findings can motivate the manufacturing companies to conduct CSR within the company by treating well the closest stakeholders, such as employees and customers. The findings can also encourage the manufacturing companies to increase their level of CSR implementation. They will not carry out CSR as a mere charity, philanthropy or compliance activity (as many currently do) or just to meet regulations, but they

should integrate CSR into their business strategy and business functions. As a result, they will achieve better financial and non-financial performance, which in turn could enhance their competitive advantage.

Nevertheless, this study focuses on the integration of CSR. Because knowledge of the antecedents of CSR integration is equally essential, future research could address this issue by interviewing executives and managers to comprehensively explore their perceptions in detail.

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REFERENCES

- Branco, M.C.; Rodrigues, L.L. Corporate Social Responsibility and Resource-Based Perspectives. *Journal of Business Ethics* 2006, 69, 111-132.
- 2. Rasche, A.; Morsing, M.; Moon, J. Corporate social responsibility: strategy, communication, governance; Cambridge University Press: Cambridge, United Kingdom, 2017.
- 3. Afrin, S. Traditional vs strategic corporate social responsibility: In pursuit of supporting sustainable development. *Journal of Economics and Sustainable Development* **2013**, *4*, 153-157.
- 4. Ganescu, M.C. Corporate social responsibility, a strategy to create and consolidate sustainable businesses. *Theoretical and Applied Economics* **2012**, *11*, 91-106.
- 5. Carroll, A.B.; Shabana, K.M. The Business Case for Corporate Social Responsibility: A Review of Concepts, Research and Practice. *International Journal of Management Reviews* **2010**, *12*, 85-105.
- 6. Marín, L.;Rubio, A.;de Maya, S.R. Competitiveness as a Strategic Outcome of Corporate Social Responsibility. *Corporate Social Responsibility and Environmental Management* **2012**, *19*, 364-376.
- 7. Hasan, I.; Kobeissi, N.; Liu, L.; Wang, H. Corporate Social Responsibility and Firm Financial Performance: The Mediating Role of Productivity. *Journal of Business Ethics* **2018**, *149*, 671-688.
- 8. Galbreath, J. Corporate social responsibility strategy: strategic options, global considerations. *Corporate Governance: The International Journal of Business In Society* **2006**, *6*, 175-187.
- 9. Porter, M.; Kramer, M. Creating Shared Value. Harvard Business Review 2011, 89, 62-77.
- 10. Torugsa, N.A.;O'Donohue, W.;Hecker, R. Proactive CSR: An Empirical Analysis of the Role of its Economic, Social and Environmental Dimensions on the Association between Capabilities and Performance. *Journal of Business Ethics* **2013**, *115*, 383-402.
- 11. Dey, M.; Sircar, S. Integrating Corporate Social Responsibility Initiatives with Business Strategy: A Study of Some Indian Companies. *IUP Journal of Corporate Governance* **2012**, *11*, 36-51.
- 12. Rinawiyanti, E.D.; Huang, X.; As-Saber, S. Adopting management control systems through CSR strategic integration and investigating its impact on company performance: evidence from Indonesia. *Corporate Governance: The International Journal of Business in Society* 2020, ahead-of-print.
- 13. Zhu, Q.;Liu, J.;Lai, K.-h. Corporate social responsibility practices and performance improvement among Chinese national state-owned enterprises. *International Journal of Production Economics* **2016**, *171*, 417-426.
- 14. Jamali, D.; Karam, C. Corporate Social Responsibility in Developing Countries as an Emerging Field of Study. *International Journal of Management Reviews* **2018**, *20*, 32-61.
- 15. Blowfield, M. Reasons to be cheerful? What we know about csr's impact. *Third World Quarterly* **2007**, *28*, 683-695.
- 16. Crifo, P.;Diaye, M.-A.;Pekovic, S. CSR related management practices and firm performance: An empirical analysis of the quantity–quality trade-off on French data. *International Journal of Production Economics* **2016**, *171*, *Part 3*, 405-416.
- 17. Talita, R.; Maria Laura Ferranty, M. Strategic human resource management and corporate social responsibility: Evidence from Emerging Markets. *Internext: Revista Eletrônica de Negócios Internacionais* **2016**, *11*, 66-80.
- 18. Sousa Filho, J.M.d.; Wanderley, L.S.O.; Gómez, C.P.; Farache, F. Strategic Corporate Social Responsibility Management for Competitive Advantage. *BAR Brazilian Administration Review* **2010**, *7*, 294-309.

- 19. Guadamillas-Gómez, F.;Donate-Manzanares, M.J.;Škerlavaj, M. The integration of corporate social responsibility into the strategy of technology-intensive firms: a case study. *Zbornik radova Ekonomskog fakulteta u Rijeci : časopis za ekonomsku teoriju i praksu* **2010**, *28*, 9-34.
- 20. Bhattacharyya, S.S. Exploring the concept of strategic corporate social responsibility for an integrated perspective. *European Business Review* **2010**, *22*, 82-101.
- 21. Maon, F.; Lindgreen, A.; Swaen, V. Designing and Implementing Corporate Social Responsibility: An Integrative Framework Grounded in Theory and Practice. *Journal of Business Ethics* **2009**, 87, 71-89.
- 22. Ooi, S.K.; Amran, A.; Yeap, J.A.L. Defining and Measuring Strategic CSR: A Formative Construct. *Global Business and Management Research* **2017**, *9*, 250-265.
- 23. Mahmoud, M.A.;Blankson, C.;Hinson, R.E. Market orientation and corporate social responsibility: towards an integrated conceptual framework. *International Journal of Corporate Social Responsibility* **2017**, *2*, 9.
- 24. Werre, M. Implementing Corporate Responsibility: The Chiquita Case. *Journal of Business Ethics* **2003**, *44*, 247-260.
- 25. Lindgreen, A.; Swaen, V.; Harness, D.; Hoffmann, M. The Role of 'High Potentials' in Integrating and Implementing Corporate Social Responsibility. *Journal of Business Ethics* **2011**, *99*, 73-91.
- 26. Dobele, A.R.; Westberg, K.; Steel, M.; Flowers, K. An Examination of Corporate Social Responsibility Implementation and Stakeholder Engagement: A Case Study in the Australian Mining Industry. *Business Strategy & the Environment (John Wiley & Sons, Inc)* **2014**, *23*, 145-159.
- 27. Putra, K.D.C. CSR: Lebih dari Sekadar Pelaksanaan dan Pelaporan. Available online: https://swa.co.id/swa/my-article/csr-lebih-dari-sekedar-pelaksanaan-dan-pelaporan (accessed on 19 July 2020).
- 28. Engert, S.;Rauter, R.;Baumgartner, R.J. Exploring the integration of corporate sustainability into strategic management: a literature review. *Journal of Cleaner Production* **2016**, *112*, 2833-2850.
- 29. Marques-Mendes, A.; Santos, M.J. Strategic CSR: an integrative model for analysis. *Social Responsibility Journal* **2016**, *12*, 363-381.
- 30. Asif, M.; Searcy, C.; Zutshi, A.; Fissher, O.A.M. An integrated management systems approach to corporate sustainability. *Journal of Cleaner Production* **2013**, *56*, 7-17.
- 31. Quairel-Lanoizelée, F. Are competition and corporate social responsibility compatible? *Society and Business Review* **2011**, *6*, 77-98.
- 32. Swink, M.; Narasimhan, R.; Kim, S.W. Manufacturing Practices and Strategy Integration: Effects on Cost Efficiency, Flexibility, and Market-Based Performance. *Decision Sciences* **2005**, *36*, 427-457.
- 33. Tonysheva, L.L.; Chumlyakova, D.V. Corporate social responsibility: The principles and the process of integration into the system of strategic management. *Asian Social Science* **2016**, *12*, 115-123.
- 34. Chi, T. Business Contingency, Strategy Formation, and Firm Performance: An Empirical Study of Chinese Apparel SMEs. *Administrative Sciences* **2015**, *5*, 27-45.
- 35. Ward, P.T.; Duray, R.; Keong Leong, G.; Sum, C.-C. Business environment, operations strategy, and performance: An empirical study of Singapore manufacturers. *Journal of Operations Management* 1995, 13, 99-115.
- 36. Weir, K.A.;Kochhar, A.K.;LeBeau, S.A.;Edgeley, D.G. An Empirical Study of the Alignment Between Manufacturing and Marketing Strategies. *Long Range Planning* **2000**, *33*, 831-848.
- 37. Martinuzzi, A.;Krumay, B. The Good, the Bad, and the Successful How Corporate Social Responsibility Leads to Competitive Advantage and Organizational Transformation. *Journal of Change Management* **2013**, *13*, 424-443.
- 38. Theodorou, P.;Florou, G. Manufacturing strategies and financial performance—The effect of advanced information technology: CAD/CAM systems. *Omega* **2008**, *36*, 107-121.
- 39. Quarshie, A.M.;Salmi, A.;Leuschner, R. Sustainability and corporate social responsibility in supply chains: The state of research in supply chain management and business ethics journals. *Journal of Purchasing and Supply Management* **2016**, *22*, 82-97.
- 40. Rinawiyanti, E.D.; Huang, C.; As-Saber, S. The integration of social responsibility into business operation: case study of Indonesian manufacturing industry. *IOP Conference Series: Materials Science and Engineering* **2019**, 703 1-6
- 41. Ridho, T.K., editor The Development of CSR Implementation in Indonesia and Its Impact on Company's Financial and Non-financial Performance. International Conference on Islamic Finance, Economics and Business (ICIFEB); 2018: KnE Social Sciences.

- 42. Chen, L.;Feldmann, A.;Tang, O. The relationship between disclosures of corporate social performance and financial performance: Evidences from GRI reports in manufacturing industry. *International Journal of Production Economics* **2015**, *170*, *Part B*, 445-456.
- 43. Beck, C.; Frost, G.; Jones, S. CSR disclosure and financial performance revisited: A cross-country analysis. *Australian Journal of Management* **2018**, *43*, 517-537.
- 44. Boesso, G.; Favotto, F.; Michelon, G. Stakeholder Prioritization, Strategic Corporate Social Responsibility and Company Performance: Further Evidence. *Corporate Social Responsibility and Environmental Management* **2015**, *22*, 424-440.
- 45. Saeidi, S.P.;Sofian, S.;Saeidi, P.;Saeidi, S.P.;Saaeidi, S.A. How does corporate social responsibility contribute to firm financial performance? The mediating role of competitive advantage, reputation, and customer satisfaction. *Journal of Business Research* **2015**, *68*, 341-350.
- 46. Kim, K.-H.; Kim, M.; Qian, C. Effects of Corporate Social Responsibility on Corporate Financial Performance: A Competitive-Action Perspective. *Journal of Management* **2018**, *44*, 1097-1118.
- 47. Nguyen, P.-M.;D. Vo, N.;Phuc Nguyen, N.;Choo, Y. Corporate Social Responsibilities of Food Processing Companies in Vietnam from Consumer Perspective. *Sustainability*. **2020**, *12*, 71.
- 48. García-Madariaga, J.;Rodríguez-Rivera, F. Corporate social responsibility, customer satisfaction, corporate reputation, and firms' market value: Evidence from the automobile industry. *Spanish Journal of Marketing ESIC* **2017**, *21*, 39-53.
- 49. Hadj, T.B. Effects of corporate social responsibility towards stakeholders and environmental management on responsible innovation and competitiveness. *Journal of Cleaner Production* **2020**, *250*, 1-10.
- 50. Shen, N.; Au, K.; Li, W. Strategic alignment of intangible assets: The role of corporate social responsibility. *Asia Pacific Journal of Management* **2019**, 1-21.
- 51. Sun, L.; Yu, T.R. The impact of corporate social responsibility on employee performance and cost. *Review of Accounting & Finance* **2015**, *14*, 262-284.
- 52. Sánchez, P.E.;Benito-Hernández, S. CSR Policies: Effects on Labour Productivity in Spanish Micro and Small Manufacturing Companies. *Journal of Business Ethics* **2015**, *128*, 705-724.
- 53. Maignan, I.; Ferrell, O.C. Antecedents and benefits of corporate citizenship: an investigation of French businesses. *Journal of Business Research* **2001**, *51*, 37-51.
- 54. Bernal-Conesa, J.A.; de Nieves-Nieto, C.; Briones-Peñalver, A.-J. CSR and technology companies: A study on its implementation, integration and effects on the competitiveness of companies. *RSC y empresas tecnológicas: Un estudio sobre su implantación e integración y efectos sobre la competitividad de las empresas.* **2016**, *12*, 1529-1590.
- 55. Reverte, C.; Gómez-Melero, E.; Cegarra-Navarro, J.G. The influence of corporate social responsibility practices on organizational performance: evidence from Eco-Responsible Spanish firms. *Journal of Cleaner Production* **2016**, *112*, 2870-2884.
- 56. Busaya, V.; Kalayanee, K.; Gary, N.M. CSR activities in award-winning Thai companies. *Social Responsibility Journal* **2009**, *5*, 178-199.
- 57. Kun, L.; Nasrin, R.K.; Weiquan, C. Corporate Social Responsibility Practices in China: Trends, Context, and Impact on Company Performance. *Sustainability* **2019**, *11*, 354.
- 58. Xie, X.;Jia, Y.;Meng, X.;Li, C. Corporate social responsibility, customer satisfaction, and financial performance: The moderating effect of the institutional environment in two transition economies. *Journal of Cleaner Production* **2017**, *150*, 26-39.
- 59. BPS. Analisis Hasil Listing: Aglomerasi Industri Manufaktur Di Indonesia. Indonesia: Badan Pusat Statistik, 2017 978-602-438-178-3.
- 60. BPS. Direktori Industri Manufaktur 2017. Jakarta, Indonesia: Badan Pusat Statistik, 2017 22 November 2017. Report No.: 0216-0099.
- 61. Hair, J.; Hult, G.; Ringle, C.M.; Sarstedt, M. A primer on partial least squares structural equation modeling (PLS-SEM), Second ed; Sage: Los Angeles, 2017.
- 62. Hair, J.;Risher, J.;Sarstedt, M.;Ringle, C. When to use and how to report the results of PLS-SEM. *European Business Review* **2018**, *31*, 2-24.
- 63. Famiyeh, S. Corporate social responsibility and firm's performance: empirical evidence. *Social Responsibility Journal* **2017**, *13*, 390-406.
- 64. Michelon, G.;Boesso, G.;Kumar, K. Examining the Link between Strategic Corporate Social Responsibility and Company Performance: An Analysis of the Best Corporate Citizens. *Corporate Social Responsibility and Environmental Management* **2013**, *20*, 81-94.

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Leveraging Smart Engineering

Surabaya, Indonesia • 25-26 August 2021

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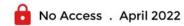
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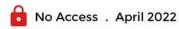
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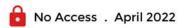


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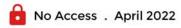
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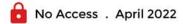


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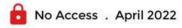
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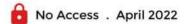


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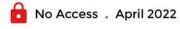
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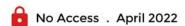


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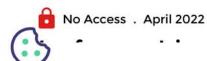


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