

Do Environmental Management Systems help improve corporate sustainable development? Evidence from manufacturing companies in Pakistan

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Abstract

This study assessed whether the adoption of an environmental management system (EMS) as a part of an integrated management system (IMS) helps improve corporate sustainability based on the data for 211 manufacturing companies in Pakistan. A stakeholder-weighted CSR index and an equal-weighted CSR index were used to measure CSR performance of the selected companies. Descriptive *t*-test and exploratory factor analysis were employed to test the hypothesis and internal consistency. Structural equation modelling was used to measure various useful links between latent and observed variables. Results revealed that the mean CSR performance of EMS adopters was significantly higher than that of non-EMS adopters. Further, EMS adopters had positive and significant effect on soundness, environmental protection, fairness and contribution to society, whereas, the non-EMS companies had positive and substantial impact on employee satisfaction and economic contribution. In conclusion, EMS adoption can be an effective tool for organisations to address economic, social and environmental issues. Moreover, EMS adoption appears to be a viable means to develop business goals and improve CSR activities.

Keywords: Environmental management system; Corporate social responsibility (CSR); Integrated management system; Sustainability

1. Introduction

The increasing concern as regards global environmental issues has forced companies to adopt a proactive approach to improve their corporate sustainability performance (Epstien,2018). According to Gianni et al. (2017), in the modern business world the integration of management standards, such as an environmental management system (EMS), has been widely regarded as an effective way for organisations to achieve social, environmental and economic business goals. In this changing scenario, EMS has emerged as an important tool for sustainable organisational development (Malteic et al., 2015; Rino & Salvador, 2017). Numerous EMS standards have been

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4 used as a benchmark, including the eco-label, sustainable textile production and environmental
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6 management and audit scheme. However, Phan and Baird (2015) revealed that several modern
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8 businesses follow the International Organization for Standardization (ISO) 14001 standards since
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10 it allows organisations to achieve their goals while considering stakeholder and legal
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12 requirements. Studies have observed that following ISO 14001 standards significantly enhances
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14 social performance, including employee health and safety, employee training and development,
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16 environmental awareness and effective communication (He et al., 2015; To & Tang, 2014;
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18 Jabbour et al., 2014).

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24 Similarly, according to Ferron Vilchez and Darnall (2016), adopting ISO 14001 standards
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26 can increase profitability and improves corporate image and credit rating. EMS, with its
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28 environmental perspective, is a tool used by organisations to reduce their respective CO₂
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30 emissions and soil contamination. Further, it simultaneously helps organisations in the efficient
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32 utilisation of water and energy resources as well as in waste management (Maas et al., 2018; Li
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34 et al., 2018). Further, organisations following EMS standards are compelled to adopt eco-
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36 friendly production processes, which result in improved environmental performance and
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38 ultimately in improvement in raw material efficiency, recycling processes, waste management
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40 and quality of product and services (Gadenne et al., 2012). Because ISO 14001 standards yield
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42 strategic benefits to organization, its popularity is on the rise (Mazzi et al., 2016). Implementing
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44 this standard can systematically support business processes and effectively address the principles
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46 of sustainable development (ISO, 2015).

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54 In the corporate world, it is the responsibility of organisations to contribute to society, which
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56 ultimately helps organisations attain sustainable development (Baumgartner & Winter, 2014). In
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58 this context, a remarkable question arises as to how a business organisation could develop a link
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4 between responsibilities and opportunities to achieve a high level of sustainable development.
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6 Previous research (Baumgartner,2014) revealed that opportunities are based on responsibilities;
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8 organisations can obtain benefits for a certain period if they only focus on responsibilities. In this
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10 context, sustainable development is an important source to enhance value creation for the
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12 organisation and society (McWilliams & Siegel, 2011). The fundamental phenomenon of
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14 corporate social responsibility (CSR) is to integrate environmental, social and economic aspects
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16 into corporate activities (Svensson et al., 2018). In general, we can differentiate among several
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18 important CSR positions, such as corporate philanthropy (Von Schnurbein et al., 2016) and
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20 stakeholder aspects (Alt et al., 2015). However, in broader terms CSR also includes
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22 environmental aspects (Chauvey et al., 2015).
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30 Currently, reaching the goal of sustainable development through CSR has become a
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32 common issue for organisations in developing countries owing to the financial cost associated
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34 with CSR practices (Wang & Sarkis 2017). The mounting competition between local and
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36 multinational corporations has forced businesses to adopt advance IMS such as EMS, includes
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38 some procedures and activities that contribute to companies so as to reduce their effect on the
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40 environment and increase companies' effectively as well. These procedures contain resources
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42 and planning for developing, the structure of the company, implementing and maintaining the
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44 policy in order to protect the environment. A suitable principle for EMS should develop based on
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46 "Plan, Do, Check, Act" model. For instant, the ISO 14001 standard is one of the best examples
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48 for EMS.
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55 Further, it is critical for modern businesses to adopt an advance management system
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57 since this will help them in efficiently managing their resources and ultimately lead to
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59 sustainable development (Yu & Lee, 2017). The primary objective of IMS is to fulfil the
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requirements of quality, health and safety, and environment management (De Oliveira Matias & Coelho, 2002; Molina-Azorín et al., 2009). Currently, businesses compete in global market, and the resultant increased level of market competition has compelled organisations to achieve sustainability through registration and implementation of standards related to quality (ISO 9001, 2015), the environment (ISO 14001, 2015), Occupational Health and Safety Management (OHSAS 18001, 2007) and other management standards (Sroufe, 2017; Asif et al., 2013a). However, compliance with these standards requires extensive paperwork, which adversely affects organisations' adherence to these management standards.

EMS includes some procedures and activities that help organizations in order to reduce their effects on the environment and increase companies' effectively. Corporate social responsibility (CSR) is an approach in business that helps sustainable development by delivering economic sectors, environmental and social advantages for stakeholders. The integrated management system (IMS) is a combination of various management standards required for sustainable organizational development. Based on these definitions, EMS and CSR have overlapped in some area and the combination of them will lead to IMS, which is shown in the figure 1.

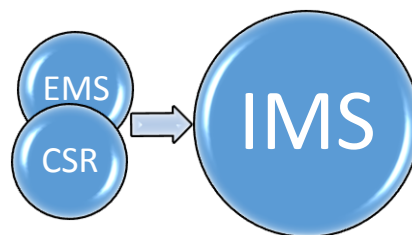


Figure 1. The relationship among EMS, CSR, and IMS.

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4 The integrated management system (IMS) was introduced as a combination of various
5 management standards required for sustainable organisational development. IMS is an important
6 tool to achieve corporate sustainability (Gianni et al., 2017). IMS offers an array of benefits to
7 organisations, such as preventing duplication of documentation, saving time and costs,
8 improving control and ensuring effective resource utilisation (Bernardo et al., 2015). Further,
9 IMS enables adopting companies to incorporate other standardised management systems, such as
10 EMSs (ISO 14001), quality management systems (QMS) and social standards (Savino &
11 Batbaatar, 2015).
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25 IMS approaches have been proposed as a means of improving CSR, either through the
26 inclusion of EMS within IMS or as part of a general corporate preparation for more efficient and
27 sbecause of the perception of high cost of EMS adoption, the low levels of green consumer
28 pressure and a lax regulatory environment (Lund-Thomsen, 2004). EMS directly addresses
29 socioeconomic and environmental needs (Costa et al., 2015; Petrenko et al., 2016; Wang and
30 Sarkis, 2017). Unlike EMS, CSR deals with the socioeconomic issues and ignores the
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43 Therefore, the current study has attempted to develop a multidimensional procedure
44 scientifically to measure the CSR performance of EMS and non-EMS adopter companies. A
45 review of the relevant literature showed that although many scholars have attempted to study
46 sustainable development, empirical evidence is lacking (Maas, Schaltegger, & Crutzen, 2016;
47 Antolín-López et al., 2016). Similarly, until date several models have been proposed and are
48 implemented at different stages to measure CSR performance on including EMS in IMS
49 (González-Benito & González-Benito, 2005; Alan et al., 2016). However, our proposed
50 framework covers a broader perspective to measure the CSR performance on integration of EMS
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4 based on sustainable development. Another significance of the present study is that it attempts to
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6 fill the existing literature gap by developing a systematic and conceptual methodological
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8 approach, considering that several studies have used different indicators. We measure CSR
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10 performance through KEJI equal-weighted CSR and stakeholder-weighted CSR indices, in
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12 which CSR performance is treated as a single index value of seven different dimensions, namely,
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14 soundness, contribution to the economy, employee satisfaction, environmental protection,
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16 fairness, contribution to society and consumer protection. A noteworthy contribution of the
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18 current study to the existing stock of knowledge is the application of structural equation
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20 modelling (SEM) for sustainability development to ensure the robustness of results.
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26 The proposed framework is applied to study Pakistan's manufacturing companies. The
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28 current situation of Pakistan is interesting to analyze because the country is under pressure of
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30 deteriorating economic and environmental situations. The economy of the country is in
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32 shambles, with little hope of its survival in the near future. The gross domestic product (GDP)
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34 growth rate is experiencing a continuous dip while other major economic parameters such as tax-
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36 to-GDP-ratio, current amount deficit, and currency performance also display dismal track record
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38 (Ali & Rehman, 2015). Likewise, the environmental condition continues to worsen. The country
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40 is facing severe climate change threats. In 2017, the Global Climate Index listed Pakistan as the
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42 world's seventh most vulnerable country to climate change (Eckstein et al., 2017). Though it is a
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44 fact that Pakistan's carbon emission is not substantial at the moment but studies alarm that the
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46 emission shall exponentially increase during the quest of economic development because most of
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48 the energy in Pakistan comes from fossil fuels (Shah et al., 2018). Also, after ratifying Paris
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50 Agreement on climate change, Pakistan is obliged to reduce carbon emission. Thus, the country
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52 needs to adopt sustainable approaches to increase economic growth without affecting the
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environment. The manufacturing sector is the second largest sector contributing to the economy after agriculture sector. Therefore, the role that manufacturing companies can play in bringing the country on the path to sustainable development is paramount to study.

The remainder of this paper is structured as follows. Section 2 presents the conceptual framework and hypothesis development of the study. Section 3 delineates its research methodology. Section 4 presents data. Section 5 discusses the results. Section 6 concludes this study.

2. Conceptual framework and hypothesis development

The conceptual framework of the present study, that is, integration of EMS into IMS towards CSR performance of the organisation, is illustrated in Figure 2. The conceptual framework is based on EMS adopters and non-EMS adopters. The top-down approach in Figure 2 simultaneously highlights the demands of stakeholders and EMS integration into IMS. Additionally, it focuses on the internal incorporation of indicators such as quality management, employee health and safety, environmental issues and other managerial issues. A review of the literature on the current area of interest revealed an extensive body of research on the integration of CSR into the business process. Du Preez and Van Zyl (2015) attempted to investigate the CSR implementation process in organisations. They concluded that this process is significantly challenging at the individual level; hence, they suggested collaboration among organisations for enhancing competencies.

In contemporary business world, the process of social integration starts with the stakeholder's requirements and voluntary initiatives that significantly focus on the management activities towards the sustainable development goal (Wijethilake, 2017). Further, the stakeholders demand legitimacy, power, and urgency are the vital determinants of this integration (Thijssens et al.,

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4 2015). According to (Sroufe, 2017) demands from the stakeholders and voluntarily initiatives
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6 will properly guide and assist management in identification, understanding, and developing both
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8 the internal and external business environment. In-addition, it also ultimately set the strategic
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10 planning of the organizations to help achieve the sustainable development. Figure 2 explicitly
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12 revealed that stakeholder demands compel companies to take into consideration social,
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14 environmental, and health and safety issues. Companies can address stakeholder's requirement
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16 generally through two mechanisms. At first place, companies should explicitly focus on the
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18 development and improvement of key performance indicators along with measurement of
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20 performance of each indicator on priority basis (Hahn, 2013). In a similar study, Yeung (2017)
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22 concluded that the main concern of organisations' CSR activities is to interact with stakeholders
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24 and fulfil their legitimate demands and expectations. Among the numerous studies also
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26 conducted on the concept of integration of CSR into business processes through the case study
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28 approach, Cornelius et al. (2008) noted how Nike's business processes integrate CSR from a
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30 defensive level to civil level through compliance. Similarly, Murphy and Schlegelmilch (2013)
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32 examined how organisations merge CSR activities in their business, using multiple case studies
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34 of different organisations. Nadkarni and Barr (2008) explained how organisations could integrate
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36 CSR effectively into business processes through a strong corporate governance structure.
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45 The integration of a top-down approach towards organisational sustainability relies on the
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47 triple bottom line, in which all three dimensions—economic, social and environmental—have an
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49 integrated effect on firm performance. Numerous studies (Yu et al., 2017; de Vries et al., 2012)
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51 have examined whether the adoption of ISO 14001 standards provides opportunities to
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53 organisations to compete in the international market. A similar study by Prajogo et al. (2012)
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55 revealed that ISO 14001 adopter companies have competitive advantages, such as improved
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4 image and strong relationship with stakeholders, and that in addition, internal adoption of ISO
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6 14001 standards helps companies reduce costs and risks.
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9 CSR performance is largely analysed on three dimensions: (i) environmental (ii) social
10 and (iii) economic. Measurement and evaluation of CSR indicators are the foundation of
11 sustainable development. The present study used these indicators to assess CSR performance of
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13 EMS adopter and non-EMS adopter companies. The Korean Economic Justice Institute (KEJI)
14 index is a standardised original scale composed of seven CSR measurements (Choi et al., 2013).
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21 A three-step procedure is widely used for evaluation of CSR indicators. In the first step,
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23 firms need to monitor business processes (communication to stakeholders), in the second step,
24 they must schedule integrated auditing (top-down approach) and in the third step, they must
25 perform benchmarking (Asif et al., 2013). In the modern business world, to increase
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27 organisational goodwill, firms usually publish figures about CSR initiatives/spending through
28 their sustainability reports, annual reports, social media and websites (Lee et al., 2017). CSR
29 initiatives should be disclosed to both types of stakeholders, that is, those directly and indirectly
30 associated with organisations, such as customers, suppliers, employees, regulators and the local
31 community (Giannarakis et al., 2014).Rebelo et al. (2018) found that the integration of EMS into
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33 IMS, among 222 Czech organisations that have implemented EMS according to ISO 14001
34 standards, is believed to improve environmental, economic and social performance, as well as
35 the relationship with stakeholders.
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50 Integrated corporate sustainability management improved product and services quality
51 and it has an effect beyond the immediate production level that correlates with the satisfaction of
52 stakeholders (Hallstedt, 2017). Rebelo, Santos, and Silva (2014) studied Portuguese firms and
53 concluded that IMS can significantly improve value creation of the organisation. Further, EMS
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4 may enhance efficiency through improvement in waste management processes (Zutshi & Sohal,
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6 2005). In a similar study, Karapetrovic and Casadesús (2009) concluded that IMS improves the
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8 overall implementation lead times, which means that the EMS adopters experience a more
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10 significant impact on their respective CSR performance.
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14 Nevertheless, the efficiency of IMS integration mostly can be assessed in a qualitative
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16 and perceptual manner even though the efficiency measurement needs a logical process to
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18 include its multiple aspects, which are possible in the form of an entrenched integrated
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20 performance management system. Understanding and assessing IMS is a significant concern of
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22 the organisation. The IMS level refers to the extent of integrated and independent management
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24 systems where the organisation can achieve the target of sustainable development of CSR to
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26 achieve environmental targets. The integration level shows that the assessment of IMS is
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28 balanced with the integration of objectives, resources and processes.
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33 Companies were asked to rate their CSR dimensions (a) in the past full year before their
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35 adoption of IMS and (b) in the first year after their adoption of IMS.
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38 The study had two research questions:
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40 RQ1: Do Pakistani manufacturing companies that included EMS in their IMS obtain
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42 more overall CSR performance improvement than those that did not?
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45 $H1_A$: CSR performance of EMS adopter companies is higher or equal than CSR
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47 performance of EMS non-adopter companies.
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50 According to Asif et al. (2013), IMS provides necessary infrastructure for integrating
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52 EMS, which improves CSR practices, whereas IMS adoption that includes EMS could have the
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54 dual impact of improving business and CSR (Muthu Samy et al., 2015).
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4 A reasonable and suitable system should consider Corporate Social Responsibility (CSR) as a
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6 crucial factor because it contributes to expanding social responsibility during the product chain.
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8 So as to help sustainable development, companies have to develop social and environmental
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10 responsibility for the products (Jorgensen et al., 2006). On the other hand, based on ISO 26000
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12 contributing and responsibility of companies about the effect of their activities on environment
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14 and society can help sustainable development and other stakeholders as well (Ionescu et al.,
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16 2018). Due to the fact that consumers mostly cannot make a balance in terms of economic and
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18 educational levels, they ought to have access to non-hazardous resources in order to make a
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20 sustainable economic, social development, and environmental protection. Also, United Nations
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22 expand the principle for consumer protection that protects the consumers from risks (Sitnikov
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24 and Bocean, 2010).
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31 RQ2: Among all IMS adopters, do the CSR components of fairness, social contribution,
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33 consumer protection, environmental protection and soundness contribute to their latent variable,
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35 distinct from the CSR components of economic participation and employee satisfaction?
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38 The integration of EMS with other management standards is concerned stakeholder demands and
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40 continuous optimization of environmental performance in order to improve sustainable
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42 development (Bernardo et al., 2017). It is necessary for companies to adopt proactive approach
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44 to achieve highest level of sustainability by integration of EMS into their IMS. This approach
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46 can create an opportunity for organizations to develop a unified system based on all management
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48 standards to improve corporate sustainability (von Ahsen, 2014). We have focused on the
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50 perceived benefits of EMS integration with other management standards. The International
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52 organization for Standardization (ISO) proposed that the integration of ISO 14001 with
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54 previously implemented ISO 9001 quality management system in order to hinder the difficulties
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4 of implementation of both standards (Wong et al., 2015). This mechanism gives the cost benefit,
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6 less duplication of documents; enhance corporate image and other benefits to companies.
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8 Integration of management standards gives competitive advantage to companies to improve
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10 technological progress as well as approach new markets with scarce resources. Companies have
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12 a growing belief that the integration of multiple management standards add values to their
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14 businesses processes and thus improve the sustainable development (Moumen and EI Aoufir,
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16 2017). Therefore, so many frameworks have been proposed but as per our knowledge, there is a
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18 lack of empirical estimation of sustainable development. We measure sustainability by KEJI
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20 index associated with multi-dimensional CSR activities comprises on seven components of
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22 soundness, economic contribution, employee satisfaction, environmental protection, fairness,
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24 contribution to society and consumer protection (see Table 1). The KEJI index is the pioneer
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26 comprehensive index comparable to other CSR indices Environment, Social, Governance (ESG),
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28 Sustainability Index (SI), KLD, United Nation Global Compact (Choi et al., 2010). The concept
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30 of IMS toward corporate sustainability is novel, which convert the company resources (inputs) in
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32 sustainability results (outputs). Moreover, the three important key construct EMS, IMS and
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34 sustainability can been seen in pre- SEM analysis model in figure 3 and that need to empirical
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36 investigated.
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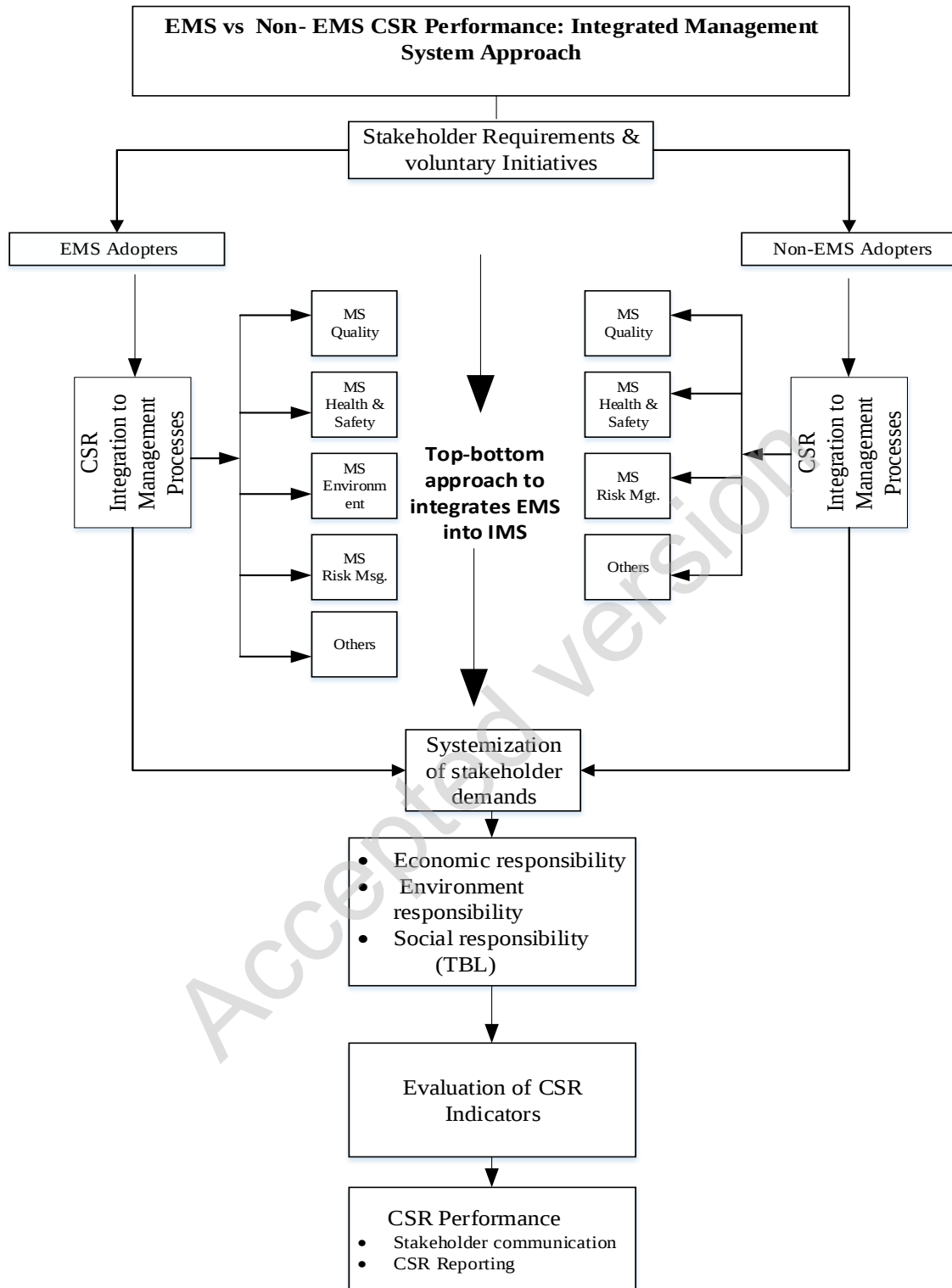


Figure 2: Top-down approach to integrate EMS into IMS and systemization

3. Research Methodology

The present study aims to investigate whether EMS adopters companies' integration of EMS into their IMS result in significant improvement in their CSR performance unlike in the case of EMS non-adopter companies. In this regard, the SEM approach is adopted to investigate the relationship between latent variables and observed variables. Based on the previous literature, the CSR measure developed in the current study is presented in this section. Further, this section provides a detailed discussion on the step-by-step development of the SEM adopted in the present study. The sources of data and the method of data collection from the study sample are also discussed in this section.

3.1 Measurement Development

For the measurement of CSR performance, we used the KEJI development model (Choi et al., 2010), in which CSR is treated as a single index value. The KEJI index is composed of 53 evaluation indicators and seven key subcomponents of soundness, contribution to the economy, employee satisfaction, environmental protection, fairness, contribution to society and consumer protection. The Corporate Citizen Index is treated as the proxy of the CSR index (Oh et al., 2011), officially known as the KEJI index. Details on the KEJI index estimation factors are provided in Table 1. The total KEJI index score is 100; prior to 2010, this score was 75.

Allocation to each subcomponent is as follows: soundness (csr2) 25, economic contribution (csr3) 10, Employee satisfaction (csr4) 15, Environmental Protection (csr5) 15, Fairness (csr6) 15, Contribution to society (csr7) 10, and Consumer Protection (csr8) 10 (Yu & Lee, 2017). Two different methods are used in the current study for measuring CSR performance of the organisations. In the first method, scores from all seven subcomponents are added. The original KEJI index allocates a different maximum score to a different type of industry. Further,

the original score of each subcategory is converted to a percentage. The instrumental stakeholder theory discussed that different firms have different stakeholder demands (Wood and Jones, 1995). Firms focus different levels of efforts on different dimensions of CSR depending on the major stakeholder's requirements, and hence, different CSR dimensions are likely to have different scores. Meanwhile, to overcome this issue a weighted measure of CSR performance is used (Choi et al., 2010). The stakeholder-weighted CSR measurement index proposed by Akpinar et al., (2008) states the significance of each stakeholder group belonging to any individual firm.

The current study first sorted the Pakistani companies by sector into textile and apparel (50), chemicals (15), glass and ceramics (25), automotive (10), fertiliser (19), cement (15), oil and gas (10), power generation (05), sugar manufacture (25), tobacco (03), leather and tanneries (14), food (09) and paper and board (11). Next, aggregate KEJI scores of all seven components of CSR are summed up to be used as the stakeholder-weighted CSR index in equation 1. Further, the sum of each individual component of the KEJI index is divided by the overall sum to calculate the weights of all seven components for every firm (see equation 2). After computation of individual weights for every firm, the original KEJI index score is multiplied with related weights to obtain the value of the stakeholder-weighted index for every company presented in equation 3. As is clear from the definition of the stakeholder-weighted CSR index, every firm has different stakeholder requirements according to stakeholders' interests. The data analysis suggests that environmental protection has been assigned a higher weight in the chemical and textile industries, whereas employee satisfaction has been assigned a higher weight in the oil and gas and cement industries. The measurement details of the equal-weighted CSR Index and Stakeholder-weighted CSR index are:

$$\text{Equal-weighted CSR index } (EW)_{it} = \sum_{k=1}^7 X_{ikt} \quad (1)$$

where X_{ikt} represents the score for company i , KEJI type k for year t . The KEJI index provides scores of seven components of CSR for which the maximum threshold value is 100, as stated in Table 1. The equal-weighted CSR index is the sum of all seven KEJI indicators and is limited by weight allocation. Moreover, we use the stakeholder weight CSR measure proposed by the stakeholder-weighted CSR index:

$$(SW)_{it} = \sum_{k=1}^7 X_{ijkt} * Weight_{jkt} \quad (2)$$

jkt indicates the score for company i in industry j , the KEJI category k for the year t ,

$$Weight_{jkt} = \frac{Average_{jkt}}{\sum_{k=1}^7 Average_{jkt}} \quad (3)$$

In addition, $Average_{jkt}$ represents the average score of industry j within KEJI category k for the year t . This compute the average score of industries within different KEJI categories at a given time. It is a useful measure because it shows category wise performance of different industries.

Table 1: KEJI indicators' evaluation and description

Indicators	Indicator Score Value	Description
Soundness (csr2)	25	Stakeholder relations, Corporate governance, Financing and investment
Economic Contribution (csr3)	10	Tax payoff, Yield growth, Sales and exports, GDP, Operating performance, Research & development, Sustainability
Employee Satisfaction (csr4)	15	Workers union, Safe workplace, Employee Relationship, Wage Compensation Benefits, Grievances & complaints, Equal gender Opportunies, Induction and training, Employee of month programme, Staff handbooks,
Environmental Protection (csr5)	15	Sustainable environmental approach, Go Green programme, Environment-friendly production, Compliance with all local and international laws, Wastewater treatment
Fairness (csr6)	15	Supplier commitment, Supply chain policy, Accountability, Transparency, Fair Trade Policy, Disclosure of information to stakeholders
Contribution to Society (csr7)	10	Charity and donations, Community investment programme, Care for ethnic minority groups and Disabled employment equality
Consumer Protection (csr8)	10	Consumer protection supremacy, Unfair and

Prior to SEM analysis, exploratory factor analysis was performed to check the reliability and internal consistency (Cronbach alpha, higher than 0.70; Cortina, 1993) of the CSR dimensions as well as latent variables with maximum likelihood and varimax rotation method.

3.2 Structural Model

The modern technique of SEM is applied to investigate the structural relationship between the latent constructs and measurement variables, which implies that the companies adopting EMS in their IMS have greater CSR performance than EMS non-adopters (Muthu Samy et al., 2015). According to Belkhiri and Narany (2015), SEM has become more popular and is frequently used in the field of social sciences. There are two stages of SEM is proposed by many researcher, in first stage each variable processed refined, followed by second stage involves the estimation of structure model (Flammer, 2013). The usage of this approach is to justify the reliability of measures in a better way to avoid the interaction between structure model and measurement (Almarshad et al., 2019).

. As a rule of thumb, if the p-value of the Satorra–Bentler scaled chi-square is equal to, or greater than, 0.05, root mean square error (RMSEA) is lower than 0.08, the value of comparative fit index (CFI) is equal to, or greater than, 0.95 and the value of standardised root means squared residual (SRMR) is < 0.05, then the model is said to have good fit (Wagner, 2015). Section 5.3 provides the details of model fitness whereas the result of final model is presented in table 7.

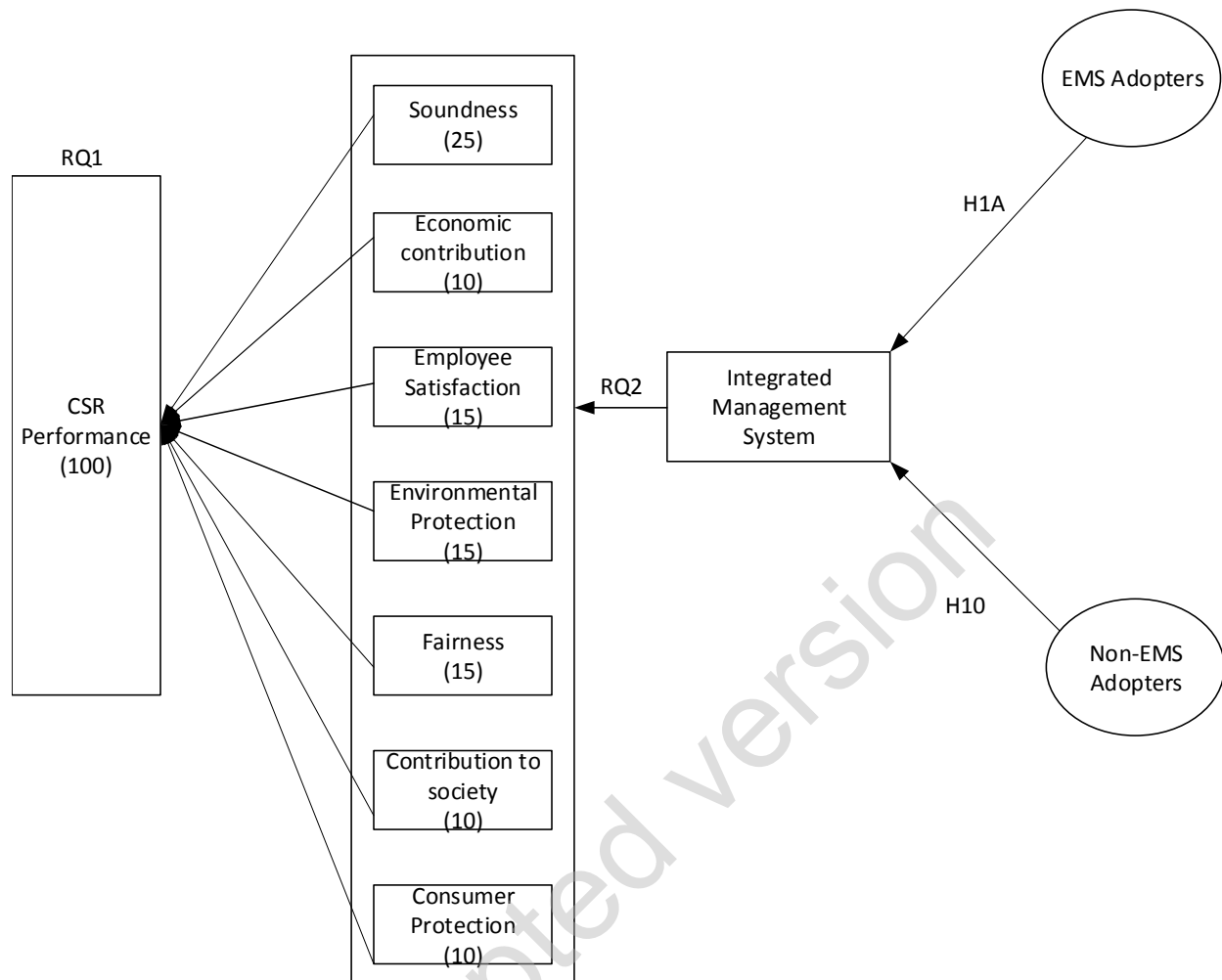


Figure 3: Pre-SEM analysis model

4. Data

For adequate and authentic data collection on CSR performance and IMS by manufacturing companies, a well-designed questionnaire was developed and was sent through email. Responses were also collected via emails. Initially, employees from 831 different manufacturing companies were requested to provide their inputs regarding the IMS adoption and CSR performance of their respective companies from 2016 to 2017. We provided the detail of questionnaire in appendix-A. These respondents included directors, quality control managers and supervisors. However, 30

questionnaires were undelivered. The respondents were given a soft reminder via email and phone calls after one month of the initial invitation. A valid response of 211 companies, indicating 25% of the sample, was received. The response rate was in line with those of similar studies (Martín-de Castro et al., 2016: 21%; Delgado Ferraz & Gallardo-Vázquez, 2016: 27%).

Descriptive statistics of the data collected, provided in Table 2, showed that only 56 companies have included EMS in their IMS and the remaining 155 companies have not. We compared the early and late respondents to check for non-response bias, but a t-test suggested no statistically significant difference. Hence, non-response bias does not seem to be a critical issue. Some questions were not answered in the 221 questionnaires; we decided not to delete these cases because the sample size was not large. We used the expectation maximisation (EM) algorithm (Jordan and Jacobs, 1994) to impute the missing values of eight unanswered questions and compared with pairwise deletion, mean substitution and non-stochastic imputation (Kawai et al., 2018). In this study, the percentage of missing values was 1% of the whole data set.

Table 2: Survey information

Study Aspect	Value
Time	2016–2017
Location	Pakistan
EMS, QMS, SA 8000 and other MS certified companies: Population (approx.)	3120
Sample size	830
Number of responses	211
EMS adopter	56
Non-EMS adopter	155
Response rate	25%

Source: self-elaboration

5. Results and Discussion

To find appropriate answers and ultimately fulfil the research objectives, the results and relevant discussion are presented in this section. The results show that 156 non-EMS adopter companies have integration of QMS, OHS and other management standards, whereas 55

companies have integration of ISO 9001, ISO 14001 and other management systems in their integration management system set.

5.1 Descriptive Analysis and Hypothesis Testing

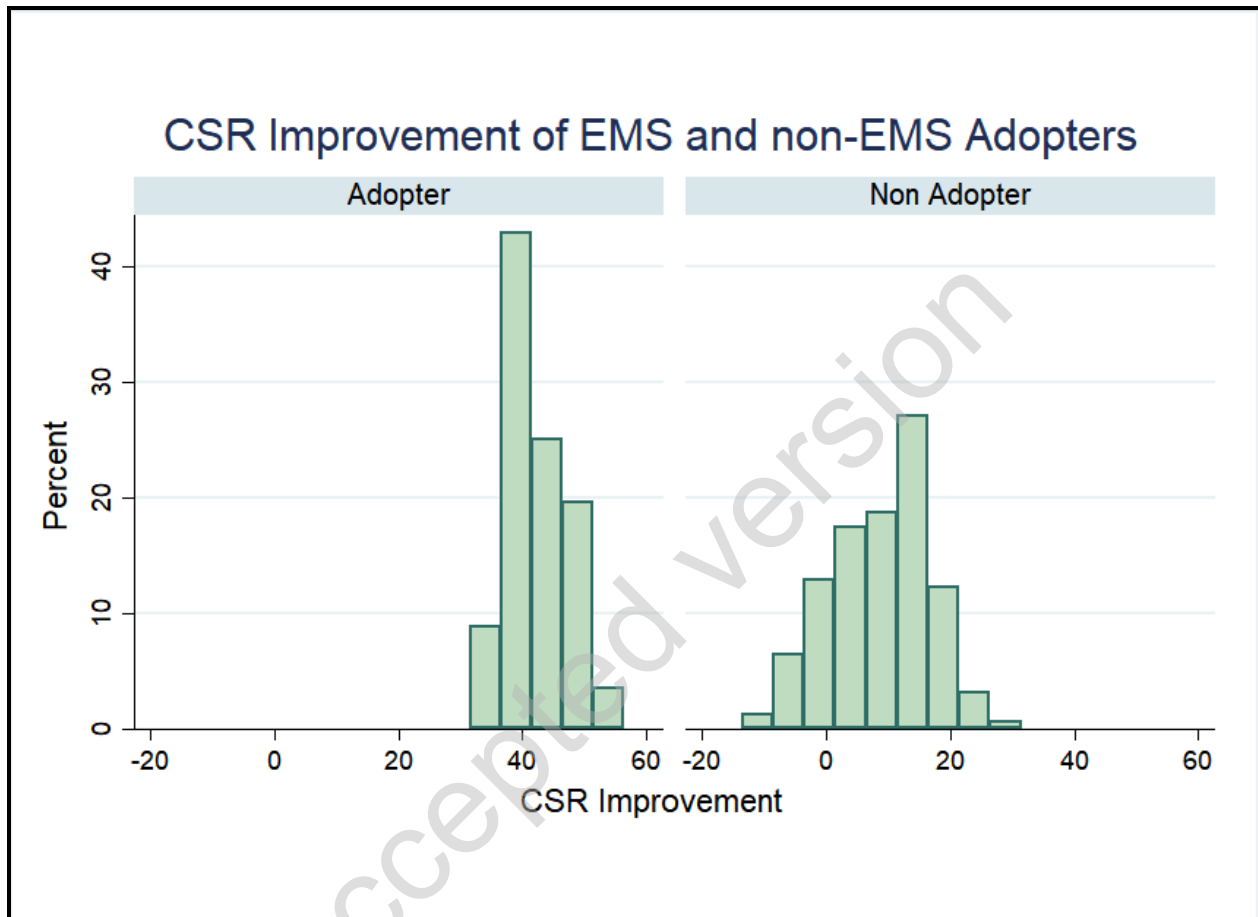


Figure 4. Histogram of CSR improvements by EMS adoption status

As for the distribution of overall CSR performance, it is to be noted that this variable is generally distributed in both the EMS non-adoption (155 companies) and EMS adoption (56 companies) groups as presented in Figure 4. The horizontal coordinates of figure 4 indicates the total CSR scores of both EMS and non-EMS adopter companies measured by KEJI index. The vertical coordinates represent percentages, which implies that 50% of total EMS adopter companies obtained 50 CSR scores out of 100. The 4% EMS adopter companies obtained highest CSR scores that was 56, on the other hand only the highest CSR score was 25 obtained

by 1 % of non-EMS adopter companies. It has been seen that the EMS adopter companies showed more CSR improvement than non-EMS adopter companies.

In Figure 5, we generated a boxplot of overall CSR change based on adoption of EMS status according to the first research question of the study, which illustrates that EMS adopter companies obtained greater CSR improvements. The box plot illustrates that Pakistani IMS adopters who had also adopted EMS obtained greater CS improvements, in the wake of their adoption, than Pakistani IMS adopters who had not adopted EMS as part of their IMS. There were only four outliers among the 211 companies, each of which was below the lower bound of the 95% confidence interval of the distributions. Moreover, EMS improves CSR practices by providing guidelines towards the continued development of the organisation's environmental impact (da Fonseca, 2015). It has been observed that the understanding and realisation of ecological effects of organisational activities among employees leads to changes in production practices in eco-friendly directions.

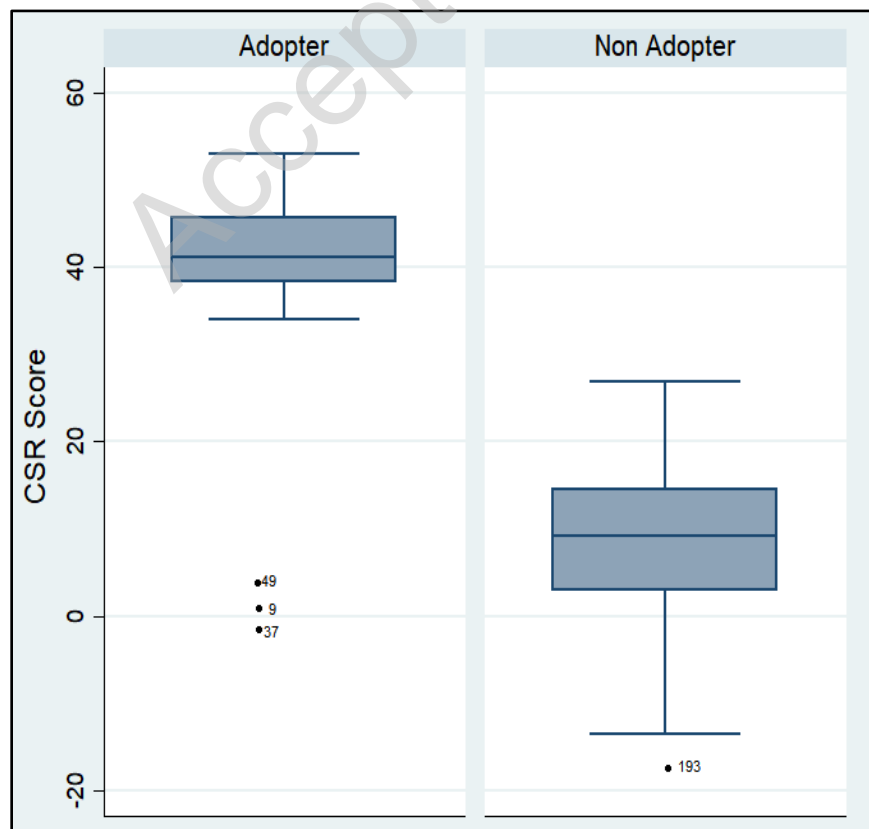


Figure 5. Overall CSR change by EMS adoption status. *Note:* Outliers identified.

Further, an independent t-test was performed on a sample of 211 companies to analyse the overall CSR performance of EMS adopter companies and compare such performance with that of non-adopter companies. Additionally, 155 companies were non-EMS adopters; the remaining EMS adopters were in the given sample. The mean CSR performance improvement of non-EMS adopters ($M = 8.670352$, $SD = 7.44626$) is observed to be significantly less than that of EMS adopters ($M = 42.12811$, $SD = 4.44626$), $t(29) = -22.681011$, $p < .0001$ in Table 3. A p-value of less than 0.05 ($p < .0001$) implies that EMS adoption has a positive impact on the CSR performance of the organisations. IMS provides an infrastructure for integrating EMS and improving CSR practices (Asif et al., 2013), whereas IMS adoption that includes EMS could have the dual impact of business and CSR improvement.

Table 3: Hypothesis testing by using two-sample t-test with equal variance

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
Non-Adopter	155	8.670352	.6385099	7.44626	4.374659	7.73773
Adopter	56	42.12811	.6423514	4.806918	26.14267	30.29334
Combined	211	17.55014	1.134716	16.4827	15.31324	19.78703
Diff		-33.457758	1.13124		-21.6435	-22.68011

5.2 Exploratory Factor Analysis

We examined all the seven CSR dimensions. The outcomes in Table 4 show that the overall result of the CSR performance reliability and Cronbach's alpha is greater than $\alpha = 0.7$.

Table 4: Exploratory factor loading analysis on CSR dimensions

Variable	Items	Factor Loading	Reliability
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Soundness	SD1	0.821	0.892
	SD2	0.783	
	SD3	0.832	
Economic Contribution	EC1	0.814	0.745
	EC2	0.735	
	EC3	0.790	
	EC4		
Employee Satisfaction	ES1	0.826	0.869
	ES2	0.786	
	ES3	0.892	
	ES4		
Environmental Protection	EP1	0.835	0.886
	EP2	0.796	
	EP3	0.861	
	EP4		
Fairness	FR1	0.726	0.755
	FR2	0.751	
Contribution to Society	CS1	0.765	0.765
	CS2	0.786	
	CS3	0.862	
Consumer Protection	CP1	0.874	0.842
	CP2	0.794	
	CP3	0.874	

The outcomes of exploratory factor analysis conducted with two latent variables, namely EMS adopter and non-EMS adopters, are documented in Table 5. Bartlett's test and the Kaiser–Meyer–Olkin (KMO) test were performed on the correlation matrix in this case. The results confirm linear dependence when the significance level of the former is 0 and KMO is higher than 0.7 between the variables, representing sound effects (Rodrigues & Borges, 2015). The Kaiser (1960) criterion withholds only those factors that have eigenvalue greater than or equal to 1. By using the varimax rotation method, these factors were reduced and weights attained for each element of the variables. Another essential significance of the total variance eradicated, and higher variance percentage, is that the fit is better.

Assessment was made to analyse the impact of integration of quality, environmental, and occupational health and safety management systems in comparison with operation as an independent system. It is concluded that integration would result in organisational benefits owing

to economies of scale and given the efficiency in the certification processes and the joint approaches towards providing quality, environmental stewardship and employee protection. The results are consistent with the findings of Wright (2000), who concluded that integrating three management systems resulted in cost reduction and promoted a team-based organisational culture with reduced departmental seclusions. Similar to the current study, Nawaz and Koç (2018) documented that integration of EMS into IMS improves CSR performance, especially environmental impact management outcomes.

A similar observation was made in a survey conducted among North American managers whose organisations had adopted EMS and ISO 14001 standards (Melnik et al., 2003). Similar to Campos et al. (2015), the author found that these organisations had improved performance and increased innovation capacity and commitment towards environment-related company targets compared with those that did not adopt these standards. Martín-de Castro et al. (2016) developed an empirical model based on an improved measurement of EMS ISO 14001 standard, which indicated the indirect effect on organisations' financial performance of the mediating role of the green corporate image. The positive consequences of IMS can be maximised through integration with core business processes, corporate governance and implementation at each level of the organisation.

Table 5: Exploratory factor analysis of adopter and non-adopter CSR practices

Variables	non-EMS adopter	EMS adopter
Soundness	0.312	0.790
Economics Contribution	0.863	0.414
Employee Satisfaction	0.796	0.430
Environmental Protection	0.321	0.807
Fairness	0.304	0.832
Contribution to Society	0.391	0.857
Consumer Protection	0.252	0.878
Value of Cronbach Alpha	0.807	0.840
KMO	0.752	0.795
Level of Significance (p-value)	0.001	0.001

Extraction Mode: Component Factor Analysis

Rotation Method: Varimax with Kaiser normalisation

5.3 Structural Equation Modelling

The SEM procedure was adopted to analyse the impact of EMS inclusion in IMS on CSR performance by using a robust estimation method. Confirmatory factor analysis was performed using version 14 of STATA statistical software. The model fitted well with both adopter and non-adopter companies. The output of the model, provided in Table 7, suggests that EMS has significantly improved the CSR practices of EMS adopter firms via providing them explicit guidelines for continuous improvement of the organisation's environmental impact, an increase of staff knowledge about the environmental effects of the organisation's activities and adoption of eco-friendly production procedures. The analysis further revealed that all of the variables included in the model are statistically significant in terms of good fit of the model. The good fit statistic of the model suggests that the nexus between IMS and CSR performance, of both integrations of EMS adopter and non-adopter companies is statistically significant. The p -value of the Satorra-Bentler scaled chi-square is higher than 0.05, RMSEA is 0.02, the value of CFI is higher than 0.95 and SRMR value is 0.027; all of these test-statistics confirm the results are statistically significant. In addition, the value of reliability coefficient is 0.805. One study conducted an assessment of 435 organisations with a Spanish origin (Bernardo et al., 2012) that had implemented at least two IMSs (ISO 9001 and ISO 14001). The study indicated that the firms that had simultaneously integrated the quality and the environmental management systems accrued higher integration benefits than the other organisations.

Table 6: The goodness of fit indices of SEM model

Fit Statistic	Value	Desirable Criteria	Description
RMSEA	0.067	< 0.08 Good	Root mean squared error of approximation

CFI	0.964	> 0.9 Good	Comparative fit index
TLI	0.942	> 0.9 Good	Tucker–Lewis index
SRMR	0.038	< 0.09 Good	Stand root mean squared residual
			Incremental fit index
IFI	1.000	> 0.9 Good	
χ^2/df	2.10	< 3 Good	Chi-square

The exact probability value of $p < 0.05$ suggests that both CSR fairness (csr6) and CSR environmental protection (csr5) have been given significant weight on SEM latent variables. Conversely, employee satisfaction (csr4) has been allotted significant weight on the latent variable of non-EMS. However, unlike the present study, Ahi and Searcy (2015) mainly relied on individual reports from survey respondents working in the organisations sampled and not the CSR index. Therefore, as indicated by the studies, IMS focuses on both the current and the future benefits of firms by improving their competitiveness against their competitors (Domingues et al., 2016; Zeng, Tam, & Le, 2010). The findings of the current study indicate that the integration of EMS into the IMS brought improvements in CSR. EMS can be used to structure the whole process of managing, measuring as well as assessing progress towards environmental impact management and CSR in general.

According to Tourais and Videira (2016), EMS helps in implementing environmental policies as well as in developing indicators for tracking performance. A similar case study conducted by Asif et al. (2013b) concluded that in multinational corporations, it is commonly observed that the integration practice of EMS into IMS is guided by environmental and health safety practices both at tactical and operational levels, which ultimately results in increased awareness among staff members. The expected CSR outcomes could be achieved when those involved understand the complexity of the IMS, its integration levels and its capabilities. Presently, a large number of organisations are trying to adopt international standards, such as ISO,

and SA (Liew and Luetge, 2016). However, the outcomes depend on the level of implementation of CSR in the organisation as well as the consistency in monitoring and evaluating environmental performance. Further, integrated objectives and integrated policy at the strategic level are most important and significant owing to the direct association of these concepts with organisational efforts to attain sustainable development that can cover CSR problems.

Results of the SEM given in Table 7 explicitly suggest that the two latent variables, EMS adopter and non-EMS adopter companies, are significantly associated with CSR performance of the firm presented in figure 6. Specifically, EMS adopter organisations exhibited greater CSR performance, while non-EMS organisations show poor performance in terms of CSR. Further, the outcomes in Table 7 revealed that EMS adoption is positively and significantly associated with CSR2, CSR5, CSR6 and CSR 7 ($\beta_2 = 1.045$, $\beta_5 = 1.148$, $\beta_6 = 0.619$, $\beta_7 = 0.880$, $p = 0.000$, 0.000 , 0.005 , 0.025 respectively). Conversely, CSR8 ($\beta_8 = 1.033$, $p = 0.320$) has a positive but statistically insignificant relationship with EMS adoption, thereby providing support for RQ2. Similarly, contrary to our expectation, non-EMS adoption were found to be positively and significantly associated with CSR3 and CSR 4 ($\beta_3 = 1.047$, $\beta_4 = 1.130$, $p = 0.000$, 0.000).

Table7: Result of structural equation modelling

Path Description	Coefficient	t-statistics	p	R ²
EMS adoption→ Soundness (CSR2)	1.045	6.440	0.000	0.500
EMS adoption→ Environmental Protection (CSR5)	1.148	7.950	0.000	0.417
EMS adoption→ Fairness (CSR6)	0.619	5.960	0.005	0.229
EMS adoption→ Contribution to society (CSR7)	0.880	7.261	0.025	0.357
EMS adoption→ Consumer Protection (CSR8)	1.033	7.471	0.320	0.430
Non-EMS adoption→ Economic Contribution (CSR3)	1.047	9.830	0.000	0.347
Non-EMS adoption→ Employee satisfaction (CSR4)	1.054	6.410	0.000	0.395

It has been observed that sustainable development is critically important for present-day organisations, because it contributes to every dimension of the organisation, such as social, economic and environmental (Strezov et al., 2017). It is also considered a documented

organisational commitment to maintain suitable development. This concept can be interpreted at the level of organisational policy, which can address legal considerations associated with organisational process and product quality, safety risks and health, environmental issues, pollution prevention and continuous improvements, which are directly responsible for employee safety and health (Mežinska et al., 2015). Objective integration can be a complex integration issue in the CSR literature, but unfortunately, none of the related studies presents empirical evidence on the objective integration in the adoption of IMS in CSR. As for objectives of the IMS adopter organisation, the objective must be measured and examined under the consideration of the attainable target variables. Simultaneously, with CSR assurance, the organisation must ensure other objectives, such as speeding up the delivery, quality, restricting the product and production level and increasing new products as well as developing a sustainable environment.

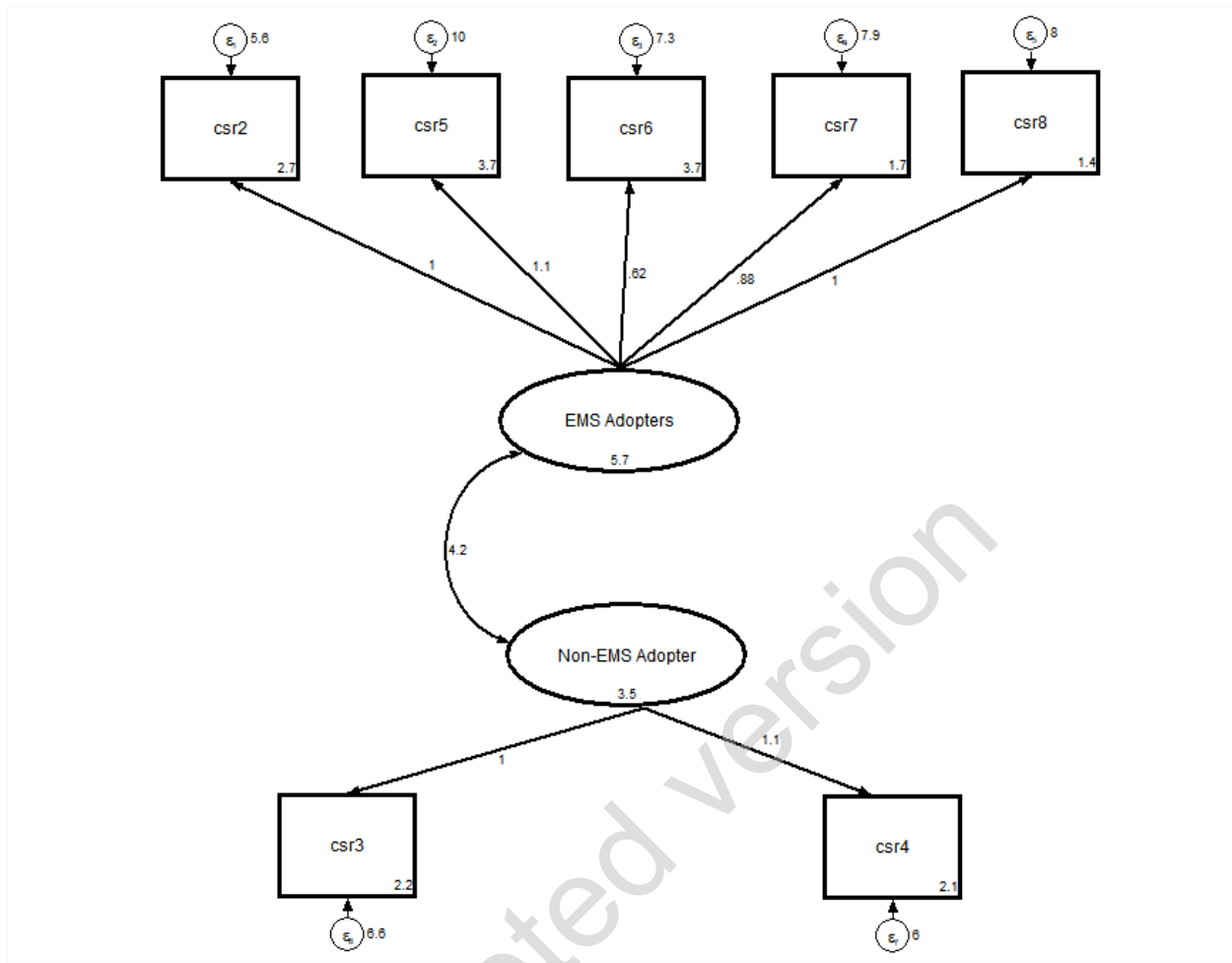


Figure 6: SEM post analysis Path diagram

6. Conclusions

This study is conducted to validate the role that EMS plays in improving corporate sustainability. A case of Pakistan's manufacturing companies is analyzed to achieve the objective of the study. The results provide substantial evidence to prove the significance of adopting EMS. It is revealed that the companies who incorporated EMS into their IMS have better corporate performance compared to the companies without practicing EMS. Besides improving corporate sustainability, EMS also improves corporate business. Therefore, EMS proves to be a viable tool for companies to reinforce business and increase long-term corporate

sustainability. It is also learned through this study that the IMS integration aids corporate sustainability if the objective is to strengthen CSR with no additional/direct funding from corporate sustainability management projects.

The descriptive analysis suggests that the number of companies having practical expertise in IMS and corporate sustainability is very low. However, this number is gradually increasing as some transitional corporations have been skewing towards the notion of adopting various standards for benefiting business as well as society. Owing to the newly emerging trends, these corporations are including employee's quality of life and community welfare among their top priorities. It is because corporations' sustainability initiatives can transform developing countries into a better place for living and conducting business.

Based on the outcomes of the study, below are some policy guidelines and practical implications which can promote EMS adoption on a larger scale:

1. The government of Pakistan should award appreciation certificates to companies adopting EMS; this shall encourage non-EMS adopter companies to incorporate EMS into their IMS system;
2. EMS seminars to increase awareness regarding the benefit of this standard for corporations and society;
3. Capacity build training for corporations regarding EMS implementation procedures; Experts from EMS adopter companies should be asked to support on-the-job training regarding EMS;
4. Companies should develop standards of procedures (SOPs) of corporate sustainability in local language making them comprehensible for a broader range of employees;
5. The internal audit of companies should ensure that the high standards have been followed;
6. Corporations should communicate EMS standards and requirements explicitly to clients and collect their feedback regarding the environmental impacts of EMS on products and services;
7. Companies should assess potential ecological outcomes/effects during the negotiation phase of contracts.

The present work can be extended by tailoring the path diagram generated in this study in a way that it reflects the portion of revenue spent on corporate sustainability. This shall also deal with the endogeneity problem which is the limitation of the current study.

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Appendix-A

<u>KEJI</u>	Indicators	Sub-Indicators
<u>Employee Satisfaction</u>		
(ES1)	Do your company provides health & safety training to employees on work place?	i. OHSAS 18000 or other related certification ii. Incident control standard operation Procedures
(ES2)	Do your company have human capital development policy?	i. Training & Coaching expenses per person ii. Investing money on employee development i. Growth rate of employee training expenses.
(ES3)	Do you satisfy with your company wages, benefits and compensation policy?	i. Employee of the month program ii. Worker welfare fund iii. Employee old age benefit program i. Minimum wage, working hours, bonus

(ES4)	Does your company have plans in place in the event that labour rights concerns are identified?	i. Labor-management relationship program ii. Share of seasonal workers ii. Labor union
<u>Economic Contribution</u>	.	
(EC1)	Do your company contribute to national finance?	i. Tax payments
(EC2)	Do your company contribute to GDP?	i. Net Exports of goods and services ii. Government Expenditures iii. Productivity growth
(EC3)	Do your company work with government officials to protect the firm's interest?	i. Corporate Governance accountability ii. General aspects of governance iii. Management and audit of corporate governance
(EC4)	Do your company have financial and economic policy?	i. Legal compliance with economic and financial aspects ii. Risks and management of economic and financial performance
<u>Soundness</u>		
(SD1)	Do your company have soundness in corporate governance?	i. Portion of internal shareholding? ii. Degree of professional manager participation? iii. Activities of outside directors? iv. Difference between ownership structure And governance structure
(SD2)	Do you have soundness of investment?	ii. Consumption expenditure iii. R&D expenditure Facility investment
(SD3)	Do you have Soundness of corporate financing?	iii. Riskiness iv. Capital injection to affiliates Debt guarantees for affiliates
<u>Environmental Protection</u>		
(EP1)	Do you operate to any environmental friendly management standard?	i. Environmental performance program ii. Certification of ISO 14001, EU Ecolabel, GOTS/OCS, Oeko-Tex.
(EP2)	Have you had any enforcement notices Or prosecutions by the Health & Safety or Environment Agency (or similar bodies in countries in which you operate) in the past 3 years?	i. Contamination of water and atmosphere ii. Violation of Environmental Pollution Agency rules & regulation. iii. Major non-conformity iv. Non-Compliance issue of code of conduct audits.
(EP3)	Do your company have environmental improved program?	i. Special arranged for waste disposal ii. Energy efficiency iii. Environmental Protection Program iv. Budget allocation of Environmental issues
(EP4)	Do your company have policy in bound to monitor environmental impacts of product and services?	i. Percentage of good manufactured from re-cycling ii. Percentage of packaging material manufacturing

		iii. from re-cycling iv. hazardous material content of the products supplied mechanism
<u>Fairness</u>		
(FR1)	Do you know your company fairness policy?	i. Economic concentration ii. Relationship with partner companies iii. Observation of financial regulations iv. Separation of financial sector and industry sector
(FR2)	Does the organization transparently disclose information?	i. Sincere disclosure of information ii. Appropriateness of business report iii. Audit committee management iv. Shareholders' voting
<u>Contribution to Society</u>		
(CS1)	Is it your practice not to discriminate directly or indirectly on grounds of race, disability, gender and transgender, sexual orientation, age and religion and belief in the provision of goods, facilities or services to the public?	i. Share of disabled people ii. Share of female workers iii. Growth rate of employees iv. Government award
(CS2)	Does your company involved in contribution activities?	i. Social welfare support ii. Donation
(CS3)	Does your company have anti-corruption	i. hours of training in anti-corruption ii. percentage of individual work in anti-corruption positions
<u>Consumer Protection</u>		
(CP1)	Does your company have a consumer protection policy (or similar policy) that requires your consumers to uphold minimum commitments relating to consumer standards which meet core consumer law on consumer rights?	i. Customer satisfaction certification ii. Customer satisfaction award iii. Consumer complaints counseling iv. Protection of financial consumer
(CP2)	Do you monitor your operations/facilities to assess their compliance with your consumer policy or directly with the consumer act on rights?	i. Unfair provisions ii. E-commerce consumer protection law violation iii. Violation of notification obligation iv. Compulsion of purchase v. Violation of laws related to visiting sales vi. Violation of laws on the fairness of franchise vii. business transactions

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		viii. Violation of laws on fair advertising
(CP3)	Does your company have plans in place in the event that consumer rights concerns are identified in your consumer program?	i. Quality and consumer safety certification

For more information, please follow this link: <http://ccej.or.kr/eng/>

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