



The Influence of Accounting Information System and Energy Consumption on Carbon Emission in the Textile Industry of Indonesia: Mediating Role of the Supply Chain Process

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ABSTRACT

The purpose related to the current article is to investigate the impact of accounting information system (AIS) and structure of energy consumption (SEC) on the carbon emission (CE) of the textile industry in Indonesia. The aim also consist upon the investigation of mediating impact of supply chain process (SCP) on the links of AIS and CO₂ emission, SEC and CO₂ emission. The employees related to the AIS and environment sustainability are the respondent who provide the data through questionnaires that were evaluated by the help of PLS-SEM. The results show that AIS and SEC have positive nexus with the CE of the textile industry in Indonesia. The results are show that SCP has positive mediation among the links of AIS and CO₂ emission, SEC and CO₂ emission. The regulation developing authorities and new researchers are the users of this article who gel help while preparing the policies and also in the exploration of this area in the future.

Keywords: Accounting Information System, Carbon Emission, Structure of Energy Consumption, Supply Chain Process

JEL Classifications: Q19, E59

1. INTRODUCTION

The accounting system of information aims to enhance various ways to the users to get enabled for the numerous information required, whether for their organization or of personal use. It is, therefore, a quantifying means where the system of accounting enjoys the advantage of lurking issues to improve the quantity and quality of information and the effective delivery of information to the end-users. It is necessary to mention the early age network about computer and information system which has been established several decades ago (Zhou et al., 2013). The relation amid information system of accounting and computer evolved a broader area near the eighties of past centuries where the development and purposed decision making was quite difficult to resolve, the vast

dimensions have taken account to resolve the issues and have made some flexible means which was later known to be computerized accounting (Beecken et al., 2015). Later on, many up gradations came up with splendid innovations in accounting software's which become popular with the ultimate shops and then become reliable for the interesting ones at an affordable cost.

It is also pertinent to mention that many organizations usually strive hard to develop their accounting and computing software either by striving hard by themselves or by the professionals, another means is outsourcing which is an effective way to get resolve the issue in the current global world (Saputra et al., 2013; Wang and Lei, 2020). Most of the multi-national firms have been found indulged in the adaption of software including their subsystems which were

become more preferable rather than the prevailing ones'. Such a system was also known to be a system of enterprise resource planning ERP, a renowned qualified application that has enabled very vast areas covered for decision making and preparing some presentations of projected plans in their organizations. Such a system has not only improved the operational performance of an organization but also has put a significant impact on the recognition of such systems (Floros and Vlachou, 2005).

The importance of consuming energy has put the vital role in the development of economy, political and social developments including financial development and cannot be put into the stressed atmosphere, such advantage is due to the inevitable use of such energy into education, transportation, communication, health, and industrial operations where such use had made the industries and system an unmanageable substitute for the companies and organizations (Lee et al., 2019). Aside from these, the improvement in the quality of life as observable in the expansion on the assembling raised modern creation, availability to shield, the upgraded arrangement of healthcare just as elective human comforts; for each of these, advancement to occur requires the utilization of energy (Velásquez and Martínez, 2013). Also, analysts have built up that energy is a fundamental factor for the achievement of various financial goals in Nigeria as well as all through the whole globe.

From the prior studies, it is adequate to contend that the elevated level of energy expected to accomplish a given degree of financial development will increment past conventional family utilization if national development is to be kept up side by side with the elements of the personal satisfaction and other mechanical prerequisites (Ahmed et al., 2019). Following to this, contend that lacking arrangement of energy limits financial tasks hampers budgetary advancement and contrarily impacts expectations for everyday comforts. Adding to the attestations kept up in endeavoring to advance the significance of energy usage in the accomplishment of the supportable national financial target, offered four restricting hypotheses concerning how energy contains the center of monetary improvement, they accentuate that: in a circumstance where energy utilization Granger causes monetary development (for example the development speculation) the creators set that energy diminishing strategies must be forestalled, and novel sources of the feasible and sustainable power source must be examined, to guarantee that adequate interest is met with proficient inventory (Suda et al., 2013).

Another potential factor recognized by the creators is that when causality was found to move from money related advancement to energy utilization, this implies energy diminishing guidelines would not suggest negative ramifications for financial improvement as monetary improvement of the country doesn't have all the earmarks of being dependent on energy, on the off chance that input theory was discovered, at that point, this gathers the between the dependence of energy utilization and financial development (Vicente-Cera et al., 2019). Following to this, an expansion in financial development will bring about the ascent of energy prerequisite, which accordingly empowers monetary development, and therefore and not at all like the primary case, energy protection strategies will hinder the heading of monetary development in a circumstance where no causality interfacing energy utilization and financial development

was discovered then this suggests impartiality theory, connoting that energy and advancement are not co-dependent. In the addition of such an energy sector, many authors also significantly argued about energy implementation in conservative measures including policies of energy exploration may also result in the prevailing path of economic growth (Table 1 and Figure 1).

With the integration of some accounting systems in the era of energy or CO₂, the certainty changes the perspectives, whether to achieve the goals set for the organizations which may be of decision making or establishing channels of information. This study has a direct impact on an accounting information system (AIS) and energy consumption on the CO₂ emission, while the supply chain management is playing the role of mediation among the elected variables. The study is comprising yearly analysis of such variables, while the table and graph are endorsing some sort of fluctuations in the energy sector while the supply chain of CO₂ also linked with the significance of the energy sector. According to the graph and table, there is a significant fluctuation in CO₂ emission on yearly basis, where CO₂ was lurking at 415 in 2012, while it left 2012 and reached at 418 in 2013, therefore some fluctuation occurred which is showing the significant increase in 2014 at 457, while the same was significantly increased with a minor change and reached at 496 in 2017. The same situation is seen in the link of AIS and EC, where the fluctuation has some positive changes which are rendering change of 49.7 in 2012, while it reduced at 48.4 in 2013 whereas the significant increase is seen since 2017 at 54.6.

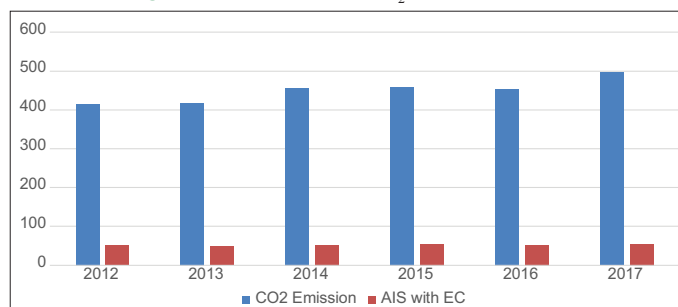
2. LITERATURE REVIEW

Since the centuries, many researchers have put forth ideas for the development and implementation of an AIS by mixing it with the energy consumption or CO₂ emission. The quality of the information provided by the studies has significantly contributed to the quantity and quality of the information in the sector of account information and energy consumption with CO₂ emissions. Many researchers aimed to provide significant results for the ERP

Table 1: Energy consumption Statics in Indonesia

Years	CO ₂ Emission	AIS with EC
2012	415	49.7
2013	418	48.4
2014	457	51.6
2015	459	54.3
2016	454	51.8
2017	496	54.6

Figure 1: Fluctuation in CO₂ with AIS and EC



implementation system of management accounting, especially after the systems spreading in wider areas and spreading in the large scale of companies (Goldsworthy, 2017). They showed that there is an absence of tending to the issue of ERP in bookkeeping writing. They investigated the experience of the American framework (SAP) and inferred that the execution of the ERP framework perishes the routine authoritative capacities, gives the administrators straightforwardly helpful data and increments of the job of administrative bookkeepers. They prescribed for additional examinations to be completed on the use of ERP framework and administrative bookkeeping.

Likewise, considered the upgrades offered by the ERP framework to the way toward bookkeeping data in business and to recognize the approaches to create an ERP framework in that later on. They studied an example of reek organizations applying an ERP framework utilizing a survey (Chen et al., 2018). They utilized the mean and standard deviation to portray the gathered information. They found that the ERP framework improves the viability of inner control in business associations just as improves the nature of bookkeeping data and increment its dependability. It additionally energizes the administrations towards improving their presentation. The examination prescribed different organizations to execute the ERP framework because of its beneficial outcomes on the money related and authoritative execution of organizations (Ng et al., 2013). Correspondingly, proposed that the effective selection of data innovation parameters would be gainful to associations, and across the board, an ERP framework would influence the different stages and steps of the association's work process. He intended to inspect the effect of the selection of ERP framework on the money related execution of organizations. In dealing with an association and executing an inner control framework the job of bookkeeping data framework (AIS) is vital.

A significant inquiry in the field of bookkeeping and the board dynamic concerns the attack of AIS with authoritative necessities for data correspondence and control (Meiryani et al., 2019). The advantages of the bookkeeping data framework can be assessed by its effects on the progress of dynamic procedure, nature of bookkeeping data, execution assessment, inner controls and encouraging organization's exchanges. In this manner, concerning the over five attributes, the adequacy of AIS is exceptionally significant for all the association execution. As per execution, the executives are a snappy developing business discipline. In this way, the execution of the board has a key task to carry out in improving the general estimation of an association (Andersson and Ivehammar, 2017). Control adequacy of monetary data dependability has influenced working execution. Earlier inquires have demonstrated that bookkeeping data framework appropriation does expand the company's presentation, productivity and activities effectiveness in Malaysia, Spain, Finland, Pakistan, and Iran. In Joined Middle Eastern Emirates (UAE) data society and the new computing devices have permitted the organizations to utilize their bookkeeping framework in their relations with providers and clients (Nawaz et al., 2013).

This improvement brought about the support of early essayists to utilize distinctive methodological methodology, informational

indexes as board and time arrangement to proceed with the examination on the nexus between energy utilization and monetary development. For instance, they strategically completed their examination from 1952 to 1982. The creators in an offer to acquire hearty outcomes dichotomized the contextual analysis into six globally driving mechanical nations that are eminent to be the main energy shoppers on the planet as at the time under study (Ibrahim et al., 2016). The results of their exploration set up the presence of a bidirectional causal relationship for the instance of Japan. Rather than that advancement, an alternate result was gotten for the instance of Canada. The Canadian research finding showed the presence of unidirectional causality from energy utilization to monetary advancement. These stunning outcomes proceeded up to the relative investigation among Italy and Germany.

In these two cases, the creators found that it is the monetary improvement that supports energy utilization in Italy, and out of the blue none in the case of Britain and France. Another spearheading study connecting money related advancement and energy utilization (Keuken et al., 2014). In that review, the creator contended that the advancement and innovation of the money related framework will lift the degree of energy utilization, and this has a job in the inflow of FDI and the upgrade in the financial activities. As per him, this improvement will deliberately help in invigorating the ascent and development of the financial exchange, and option monetary framework. The essayist demands that these will bloom to guarantee the flourishing of innovative possibilities in addition to other things (Perroni and Rutherford, 1993). In a related advancement, expressed that money related improvement helps with empowering nearby necessities of current power gadgets. In light of that expansion, energy utilization will rise. To break down this rationale, explored the situation of the effects of money related advancement on energy utilization in Guangdong, China (Sajjad Hussain et al., 2017).

The finding of the creator superbly exhibited the presence of a unidirectional causal connection, running from money related improvement to energy utilization. A practically identical undertaking was noted in the example in the examination of 22 creating economies somewhere in the range of 1990 and 2006. The finish of the creator underscored the pattern that energy utilization was essential in that main land's understudy especially in expanding the spate of budgetary advancement. In that review, the creators investigated the accuracy of the effect of how budgetary improvement can upgrade energy utilization in Pakistan. In their exact research clarifications, the scholars built up this can be ascribed fundamentally to the capacity of budgetary improvement to empower the necessity of consumables in offices just as non-offices established tasks (Leong and Singhal, 2015b). Implying that there is bidirectional Granger causality as for each other. Different examinations connecting monetary development, budgetary advancement, energy utilization, and CO₂ discharge incorporate those of among others.

As indicated by the past research progress and the observational suppositions declared by before analysts, get the job done for us to push that an expansion in proficient and powerful energy framework and budgetary advancement will provoke the ascent

in business tasks of a nation. This improvement will, thusly, bring about the feasible development and advancement of pioneering productivities. The ascent in these three components (productive and adequate energy, money related improvement and enterprise) will prompt development in sending out. Taking everything into account (Sajjad Hussain et al., 2018). This advancement will render it fundamental for the necessities of extra energy proficient hardware just as fare coordinated mechanical assembly for usage in conveyance and delivery to the air terminals and harbors, where such fares are consequently stuffed and re-pressed to worldwide goals (Ciuffo and Miola, 2012). The chain of activities right now energy to work. Also, an expansion in business yield, exportations, and worth included financial activities will bring about the ascent in energy utilization and the contrary will be valid.

In a related improvement, the export directed energy idea keeps up that a diminishing in trades influences the utilization of energy (Velasco and Roth, 2010). Notwithstanding, the energy coordinated speculation on its part settled that any significant decrease in energy utilization will influence the development of fares. In another point of view, it has been built up by driving analysts (Kagawa et al., 2015). In these two investigations, the creators contended that the presence of a causal relationship connecting fares and energy is very extensive. The creators put together accept concerning the way that energy is a significant angle in setting up the heading of fares although fares are huge perspectives in representing utilization of energy (Fridley et al., 2010). These affiliations connecting energy utilization and sources of info have a practically identical powerful tendency like fare. In the two unique occasions, energy utilization may not be forestalled. Theoretically, any decrease in imports will affect the utilization of energy by methods for an impressive impediment in guiding the imported products to the right area and separate systems in this manner, halting conveyance, and infringing on the structure of the store network organize. Generally, it is evident to take note that, at whatever point, the stockpile affixes are disturbed because of poor energy supply, at that point became clear that the state government assistance structure will be encroached, because of significant interruption of data sources and yields (Luo et al., 2017).

This improvement will thus influence the request and supply structures. Board contemplates completed with regards to the Sub-Saharan African countries likewise exist and prominent among these examinations is that of the creators in their exact research exertion investigated the elements associating the connection between utilization of energy, incomes, and budgetary advancement and CO₂ outflows by including work and speculation as to potential variables of boosting nearby yield (Leffel and Abdolhosseini, 2005). Their exact exercise uncovers that utilization of energy pushes financial development. This force will thusly endure and solidify up to a position where an expansion in monetary improvement and utilization of energy will prompt an expansion in the prerequisite for money related administrations (Hussain et al., 2012). Such will also in return allows some sort of financial developments for raising the ecology standards by CO₂ emissions management (Yuan et al., 2016). Various authors argued about the management of

CO₂, where the policy and effective means have overcome the issue by placing some efficiency and regulations of financial visibilities. While dealing with the case of turkey, it is also analyzed that financial development cannot be realized as an element reducing the CO₂ emissions. Following are the hypothesis of this study:

- H₁: There is a significant association between AIS and CO₂ emission in the textile industry of Indonesia.
- H₂: There is a significant association between the structure of energy consumption (SEC) and CO₂ emission in the textile industry of Indonesia.
- H₃: Supply chain process (SCP) mediates the relation between AIS and CO₂ emission in the textile industry of Indonesia.
- H₄: SCP mediates the relation between AIS and SEC in the textile industry of Indonesia.

3. RESEARCH METHODS

The purpose related to the current article is to investigate the impact of AIS and SEC on the carbon emission (CE) of the textile industry in Indonesia. The aim also consist upon the investigation of mediating impact of SCP on the links of AIS and CO₂ emission, SEC and CO₂ emission. The employees related to the AIS and environment sustainability are the respondent who provide the data through questionnaires that were evaluated by the help of PLS-SEM. A total of 345 questionnaires were returned out of 520 questionnaires that represents around 66.35 percent response rate. The AIS has 20 items, SEC has 12 items, SCP has 7 items and CE has 10 items that are mentioned in Figure 2.

4. FINDINGS

The results indicated that convergent validity is proved that shows items are highly correlated because all the loadings are more than 0.50, Alpha values of all the variables are more than 0.70, Cr values also >0.70 and AVE values of all the variables are more than 0.50 and these figures are mentioned in Table 2.

The results indicated that discriminant validity is proved that shows constructs are not highly correlated because all the values of the current constructs are more than the rest of the variables and these figures are mentioned in Table 3.

Figure 2: Theoretical framework

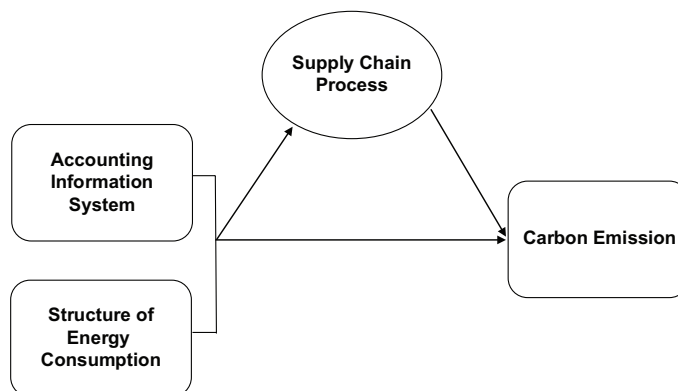


Table 2: Convergent validity

Constructs	Items	Loadings	Alpha	CR	AVE
Accounting information system	AIS1	0.845	0.969	0.972	0.644
	AIS10	0.810			
	AIS11	0.802			
	AIS12	0.797			
	AIS13	0.718			
	AIS14	0.786			
	AIS15	0.767			
	AIS16	0.827			
	AIS17	0.848			
	AIS19	0.825			
	AIS2	0.804			
	AIS20	0.829			
	AIS3	0.716			
	AIS4	0.837			
	AIS5	0.791			
	AIS6	0.765			
	AIS7	0.832			
AIS8	0.799				
AIS9	0.828				
Structure of energy consumption	SEC1	0.773	0.930	0.933	0.538
	SEC10	0.728			
	SEC11	0.732			
	SEC12	0.644			
	SEC2	0.667			
	SEC3	0.654			
	SEC4	0.771			
	SEC5	0.714			
	SEC6	0.806			
	SEC7	0.707			
	SEC8	0.815			
	SEC9	0.768			
Supply chain process	SCP1	0.829	0.938	0.950	0.730
	SCP2	0.862			
	SCP3	0.857			
	SCP4	0.828			
	SCP5	0.878			
	SCP6	0.871			
	SCP7	0.856			
Carbon emission	CE1	0.576	0.920	0.934	0.588
	CE10	0.787			
	CE2	0.766			
	CE3	0.843			
	CE4	0.645			
	CE5	0.811			
	CE6	0.798			
	CE7	0.782			
	CE8	0.815			
CE9	0.803				

The second method to test the discriminant validity is cross-loadings and results indicated that discriminant validity is proved that shows constructs are not highly correlated because all the values of the current constructs are more than the rest of the variables and these figures are mentioned in Table 4.

The latest method of checking the discriminant validity is Heterotrait Monotrait ratio and results indicated that discriminant validity is proved that shows constructs are not highly correlated because all the values are lower than 0.90 and these figures are mentioned in Table 5 and Figure 3.

Table 3: Fornell larcker

	AIS	SEC	SCP	CE
AIS	0.802			
SEC	0.350	0.734		
SCP	0.454	0.357	0.855	
CE	0.520	0.379	0.412	0.767

Table 4: Cross-loadings

	AIS	SEC	SCP	CE
AIS1	0.845	0.284	0.374	0.477
AIS10	0.810	0.310	0.378	0.473
AIS11	0.802	0.289	0.365	0.457
AIS12	0.797	0.209	0.365	0.299
AIS13	0.718	0.249	0.350	0.353
AIS14	0.786	0.273	0.365	0.393
AIS15	0.767	0.302	0.347	0.402
AIS16	0.827	0.242	0.392	0.401
AIS17	0.848	0.286	0.370	0.463
AIS19	0.825	0.302	0.369	0.453
AIS2	0.804	0.292	0.373	0.454
AIS20	0.829	0.342	0.344	0.466
AIS3	0.716	0.249	0.346	0.341
AIS4	0.837	0.308	0.383	0.453
AIS5	0.791	0.273	0.359	0.389
AIS6	0.765	0.307	0.346	0.407
AIS7	0.832	0.243	0.391	0.400
AIS8	0.799	0.211	0.360	0.304
AIS9	0.828	0.332	0.347	0.465
SEC1	0.132	0.773	0.160	0.202
SEC10	0.062	0.728	0.118	0.116
SEC11	0.109	0.732	0.113	0.094
SEC12	0.137	0.644	0.127	0.095
SEC2	0.459	0.667	0.392	0.420
SEC3	0.459	0.654	0.420	0.433
SEC4	0.139	0.771	0.167	0.200
SEC5	0.174	0.714	0.265	0.262
SEC6	0.181	0.806	0.147	0.221
SEC7	0.171	0.707	0.274	0.260
SEC8	0.203	0.815	0.175	0.224
SEC9	0.151	0.768	0.155	0.142
SCP1	0.325	0.307	0.829	0.345
SCP2	0.398	0.277	0.862	0.348
SCP3	0.370	0.299	0.857	0.332
SCP4	0.401	0.303	0.828	0.303
SCP5	0.395	0.341	0.878	0.320
SCP6	0.415	0.290	0.871	0.380
SCP7	0.406	0.317	0.856	0.424
CE1	0.295	0.363	0.192	0.576
CE10	0.465	0.303	0.332	0.787
CE2	0.477	0.309	0.370	0.766
CE3	0.427	0.300	0.349	0.843
CE4	0.256	0.283	0.236	0.645
CE5	0.443	0.322	0.328	0.811
CE6	0.379	0.246	0.302	0.798
CE7	0.383	0.244	0.349	0.782
CE8	0.417	0.272	0.343	0.815
CE9	0.374	0.278	0.312	0.803

The path analysis show that the AIS and SEC have positive nexus with the CO₂ emission and accept H₁ and H₂. Moreover, SCP also positively mediates among the links of AIS and CO₂ emission (Figure 4), SEC and CO₂ emission and accept H₃ and H₄. These values are mentioned in Table 6.

Figure 3: Measurement model assessment

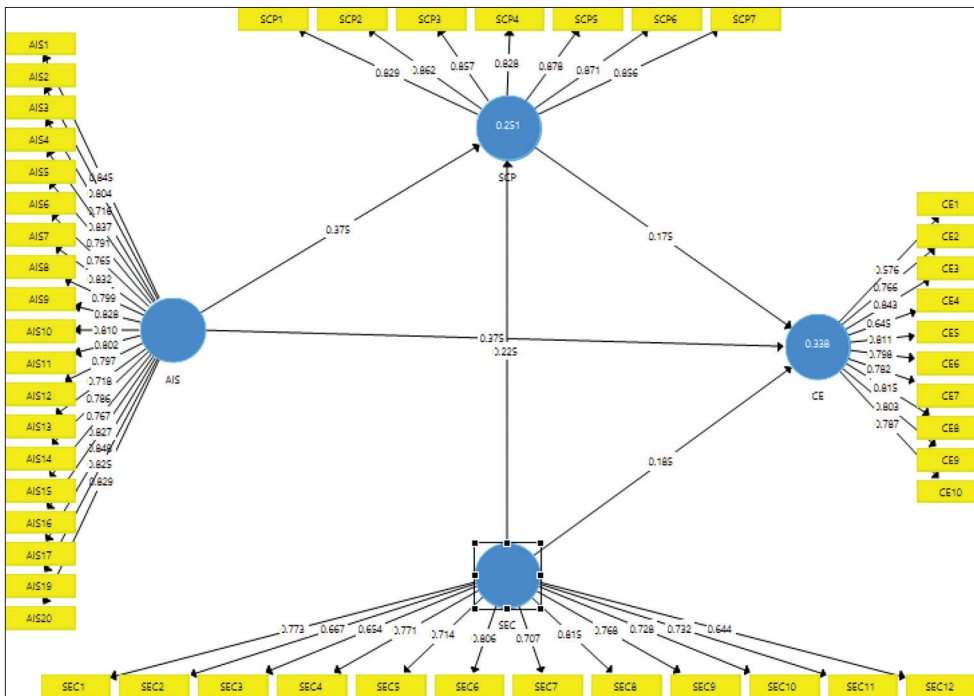


Figure 4: Structural model assessment

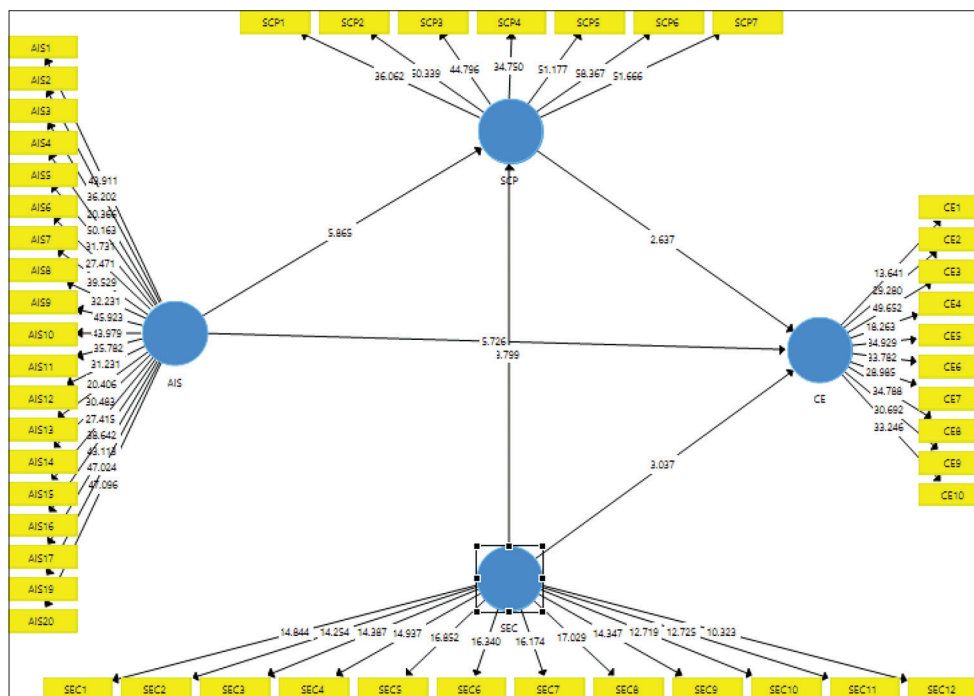


Table 5: Heterotrait monotrait ratio

	AIS	SEC	SCP	CE
AIS	0.276			
SEC	0.476	0.298		
SCP	0.539	0.323	0.437	
CE				

5. DISCUSSIONS

The results show that AIS and SEC have positive nexus with the CE of the textile industry in Indonesia. The results are show that SCP has positive mediation among the links of AIS and CO₂ emission, SEC and CO₂ emission. The regulation developing authorities and

Table 6: Path analysis

	Beta	SD	t-values	P-values	LL	UL
AIS -> SCP	0.375	0.060	6.236	0.000	0.275	0.475
AIS -> CE	0.375	0.066	5.663	0.000	0.262	0.486
SCE -> SCP	0.225	0.060	3.730	0.000	0.125	0.317
SCE -> CE	0.185	0.056	3.297	0.001	0.093	0.289
SCP -> CE	0.175	0.069	2.540	0.006	0.048	0.289
AIS -> SCP -> CE	0.066	0.027	2.462	0.007	0.021	0.111
SCE -> SCP -> CE	0.039	0.020	1.977	0.024	0.010	0.077

new researchers are the users of this article who get help while preparing the policies and also in the exploration of this area in the future. The explanation is that energy helps with abrogating extreme craving and destitution, accomplishing worldwide essential getting the hang of, propelling sexual orientation balance just as diminishing youngster passing (Rehmatulla et al., 2017). Energy likewise helps in improving maternal prosperity, battling contamination, enabling ladies and finding out environmental upkeep (Al-Salem, 2015). Some issues that prevail in the process of decision making management and accounting relate the fitting with the system of accounting information with the requirements of the organization for control and communication of information. To control activities of an organization and for the coordination purpose, the computer-based system is designed which endorses the significance of the accounting system for the aim of providing tasks of support and information (Wang and Rutherford, 2015). Many studies have examined the models of such accounting system between the certain tasks of environment, technology, and structure amid AIS, although such models endorse success of information sharing that is directed in the research of AIS, while such is also not examined as the designed system which constructs the effectiveness between systems of accounts.

6. CONCLUSION

Finally, this study concludes that the textile industry of Indonesia are using the AIS and also usage the high amount of energy that enhance the CO₂ emission in the country while SCP boost up the consumption energy in the textile industry that also enhance the CO₂ emission in the country. In some ways as an example, the system of accounting information has enabled electronic banking for companies to get fair access to electronic transactions (Leong and Singhal, 2015a). The study not only elaborates on the significance of elected variables, whereas; the relationship amid such designs and strategies has been found very effective for implementing strategically gained performance in organizations and management systems.

The wide area of work on energy consumption and financial development nexus has contributed to the field of research while such part is considered to be an effective means for the impact on energy economic influences. In that review, the creators were the first to set up the presence of a unidirectional causal relationship between GNP advancement and energy utilization for the instance of the US in 1947-1974. Consequent to that advancement, various analysts and Long rethought the disclosure. The creators in their

new research try to utilize new informational index and diverse time allotment (Zhu et al., 2019). The exact finding of the creators built up the dismissal of a unidirectional relationship among energy and GNP advancement as on account of Kraft and Kraft.

This study takes only AIS and SEC as the predictor and also ignore the moderation impact on the CO₂ emission and suggested to the future studies that they should incorporate these point in their analysis. In addition, its results are only implemented in the Indonesia and future studies should undertake other countries in their evaluation to expand the scope of the study.

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