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# The Essence of Fuel and Energy Consumptions to Stimulate MSMEs Industries and Exports: An Empirical Story for Indonesia

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## ABSTRACT

Economics and the environment are issues that never end for debate. As long as the two are not sustainable, they will continue to be highlighted in macroeconomic principles. In addition, economic growth (GDP) is not the only principal topic that is the focus of attention from academics, practitioners, and the government. The objectivity of this research is to dissect the relationship between coal consumptions, electricity consumptions, and oil consumptions on MSMEs and contributors of exports of goods and services in Indonesia. Path analysis supports the test instrument. We implement secondary data to cover seven periods (2014-2020). Regarding the research flow, there are three problem formulation packages that must be investigated, including two direct paths and mediation pathways. The identification results report several important inventions. Coal consumptions and oil consumptions have triggered a positive increase in MSMEs and contributors to exports of goods and services. From another scope, electricity consumption as empirical evidence that affects the contribution of exports of goods and services through MSMEs. The findings of this study provide valuable insights into the sustainability of the MSME industry, creating added value for Indonesian exports, without ignoring regulations related to fuel and energy.

**Key words:** Coal, Oil, Electricity, MSMEs, Exports of goods and services, GDP, Path analysis, Time-series.

**JEL codes:** Q30, Q32, Q43, F14, B22, C12, C22.

## 1. INTRODUCTION

Learning from the lessons in 1998, Indonesia experienced a critical phase because of the monetary crisis that caused the collapse of most large companies. However, the great economic shock was actually expected by micro, small and medium enterprises (MSMEs) which have contributed to the national economy (Tambunan, 2010). At least, MSMEs absorbs employment, overcomes social problems such as poverty and unemployment, is relatively stable from the financial crisis, and even has the highest share of GDP compared to other sectors to date (Muliadi et al., 2020).

Turning to the transition period, where MSMEs focus not only on efforts to improve welfare and increase per capita income on a national scale (Adrian, 2018), but how their existence is to continue to make improvements towards innovation and creativity in spurring global competition (Prasetyanto et al., 2021). The demands on MSMEs should also be part of the macroeconomic framework to respond to the share of exports, which of course have broad demand (Ackah and Vuvor, 2011).

Today, the most relevant issue to be discussed is the soaring price of fuel because of the scarcity of stock in the market (Wignaraja, 2003; McLean and Charles, 2019). As known, the double effect of this is an increase in the energy sector, which has a fatal impact on the real sector, especially MSMEs (Indonesian Ministry of National Development Planning, 2018). Recognizing this, mobility concerns about inflation in the energy sector have not escaped the government's concern. Policies that need to be implemented are controlling excessive imports of oil and coal, restricting the use of energy such as electricity, which is wasteful, and highlighting local products (Ozturk, 2013; Wu et al., 2018). With this concrete step, at least it can provide broad information to the public and business actors, in terms of consumption and to empower the micro sector effectively.

The Global Economy (2021) and the Indonesian Ministry of Cooperatives, Small and Medium Enterprises (2021) report data related to coal consumptions (CC), electricity consumptions (EC), oil consumptions (OC), MSMEs, and capacity for export of goods and services (CEGS) to GDP in Indonesia. In the last seven periods, the ability of MSMEs has increased every year, where in the last 2020 there were 64.2 million units or grew 5 percent from the previous period. If detailed, the amount is equivalent to 99.99 percent of the total business units in Indonesia. MSMEs have absorbed 96.92 percent of the total workforce, or at least 119.6 million people who rely heavily on this industry. On the one hand, there are 0.01 percent of large-scale businesses nationally and MSMEs continue to grow sharply. There is no doubt the MSME industry can contribute that 60.51 percent of GDP at current prices. Interestingly, regarding GDP at constant prices, performing MSMEs also resulted in a positive performance reaching 57.14 percent. Implicitly, non-oil and gas exports originating from MSMEs reached IDR 339.2 trillion, and that figure reached 15.65 percent of Indonesia's total exports in 2018.

**Table 1:** Trends in consumptions of coal, electricity, oil, MSMEs growth and exports in Indonesia

	<b>Coal consumption</b>	<b>Electricity consumption</b>	<b>Oil consumption</b>	<b>MSMEs</b>	<b>Exports of goods and services</b>
2014	79,443	183.8	1,361	57.9	23.67
2015	83,974	194.2	1,406	59.3	21.16
2016	95,365	199.3	1,487	61.7	19.09
2017	99,814	212.7	1,575	62.9	20.18
2018	106,957	221	1,698	64.2	21
2019	126,854	248.9	1,664	65.5	18.45
2020	152,580	263.1	1,688	67.4	17.17

Sources: The Global Economy (2021); Indonesian Ministry of Cooperatives, Small and Medium Enterprises (2021); BPS (2021).

Not only that, Table 1 shows that the carrying capacity of abundant fuel drove the progress of MSMEs. During the 2014–2020 period, CC and OC were increasing because the national supply was relatively safe (last data showed 152,580 thousand tons for CC and OC was 1,688 thousand barrels per day). This increase supports the MSME climate that continues to soar without worrying about access to electrical energy and making production prices affordable. Surprisingly, the role of CEGS in GDP decreased on two occasions, in 2015–2016 and 2019–2020, to be exact. In fact, 2014 was a period that was symbolized by a significant reaction from Indonesia's might at the ASEAN and global levels regarding consumer enthusiasm. Specifically, in 2020, the export value is 17.17 percent, with EC support of 263.1 billion kilowatts per hour.

With limited fuel commodities (coal and oil), it has the potential to curb the flow of energy such as electricity for the MSME industry, which does not stimulate production inputs, so that the flow of work to process goods and services also reduced. According to Maksum et al. (2020), the productivity of MSMEs in Indonesia highly depends on electricity supply. Sovacool (2017) claims that if the supply of coal and oil drops sharply, it will affect the market equilibrium point. Instantly, a country's hyper-inflation occurs, vital needs such as electricity are also expensive, and it hinders consumption levels (Yolanda, 2017). In line with the demand for electricity, until now there is no renewable energy to replace it because it comes from fossil fuels (Owusu and Asumadu-Sarkodie, 2016; Kåberger, 2018). Therefore, the MSME industry must try to increase the price of goods and services or vice versa (degraded). Consumers who are classified in the lower middle class are very vulnerable to decreased purchasing power because of inflation (Wogart, 2010).

Based on this constructive explanation, the context of this study seeks to think about the challenges of SMEs and support the export of goods and services in Indonesia through empirical testing. We should note that the factors that affect the MSME industry and exports, we limit it to CC, OC, and EC to be consistent with the phenomenon. We arranged the structure of the research into five points (introduction,

theoretical framework and hypothesis development, methods, data analysis and discussion, then conclusion of the last session).

## 2. THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

### 2.1. Coal consumptions

Zhu and Zhu (2020) package and define 'capitalization of coal resources' in China. Here, oil reconstruction is to follow the direction of 'green development' with ideological terms into resource capitalization theory. Based on six fundamental frameworks (harmonious consistency theory of capitalization, industry theory, capitalization environmental protection theory, benign cycle sustainable development theory of capitalization, industrial ecology mainstream development theory, and capitalization conservation theory), they unify and design an outline for 'sustainable development' for China. This formality, of course, is the reason for Yuan (2015) to describe the status of the key technology and theory in considering the flow conditions in the coal basin and gas deposition in China. In application, the use of gas and coal is a little more advanced and makes the basis of the system greener than before.

Harjowiryo and Siallagan (2021) believe that government intervention has influenced MSMEs in Indonesia to continue to survive. They cannot separate the sustainability of MSMEs from the government help scheme through subsidized cheap fuel (coal) specifically for small industries. The literacy and help program for SMEs in convincing them to change the paradigm slowly in using fossil fuels.

Priyagus (2021) assumes that maximum profit can be got if businesses in the transportation sector in Indonesia during 2000-2019 take part in energy-saving campaigns. This means that environmental aspects can motivate carbon gas emissions and play a role in reducing efficiency in the transportation sector. In the long term, environmental quality requires public attention, so that significant macroeconomic achievements and investment orientation encourage more controlled export activities.

Given these reasons, it makes sense that we decide on the following hypothesis:

*H1(a): The higher the CC level, the more positive MSMEs are.*

*H2(a): The higher the CC level, the more positive CEGS are.*

### 2.2. Electricity consumptions

Guo et al. (2018) understand that the proportion of electricity consumption in change has skyrocketed. In recent decades, total energy consumption has also increased worldwide. Sometimes, the promotion of energy conversion for household needs becomes very important because this is a sustainable development strategy for the lack of natural resources. The intervention aims to encourage them to reduce their consumption of electrical energy through behavioral changes. Meanwhile, Hasanov and Mikayilov (2024) reviewed energy demand with a theoretical framework. Through a series of empirical modeling of the demand for the electricity industry in Saudi Arabia, the estimated output concludes a very poor estimate of over-use.

It turns out that export performance and economic growth, which are influenced by energy consumption in the short and long term, are not just rumors of Nepal. In the period 1980-2018, the estimation by Thapa-Parajuli et al. (2021) yields the surprising finding that there is a significant positive integration between energy consumption and exports. The investigation concludes that there is a unidirectional causality between energy consumption, exports, and economic growth. Most recently, Erkan et al. (2010) explored the role of electrical energy consumption on exports in Turkey during 1970-2006. So far, energy consumption is a vital factor for the Turkish economy and has grown with a harmonious causality and has a positive impact on exports.

Based on the justification of some of these highlights, we propose two hypotheses, namely:

*H1(b): The higher the EC level, the more positive MSMEs are.*

*H2(b): The higher the EC level, the more positive CEGS are.*

### 2.3. Oil consumptions

Hoult and Shaw II (2008) explain the mechanism in the theory of oil consumption, which is predicted to be non-dimensional and semi-empirical with experimental accuracy. Since the 18th century, it built oil production small in small industries and now continues to grow magnificently. Rahman et al. (2018) argue that oil is a dynamic element that supports the welfare and modern economy of a nation. Currently, economic growth and oil consumption go hand in hand to reduce constraints in oil distribution. In the period 1980-2015 in Bangladesh, the status of income per capita and economic growth returned to normal because of the adoption of energy policies related to oil consumption.

13

Tende and Obumneke (2014) support the development of SMEs in Nigeria by examining the impact of petroleum derived from domestic production, imported oil, and oil prices. There is an equilibrium between the three variables in determining the development of SMEs in Nigeria. Although oil refinery production is low, the government has imported shortages, which have implications for distribution and sales costs. Local farmers and producers now have to pay more for the transportation of their services and goods to inter-regional markets. Because of the continuous increase in oil prices, it has caused distortions in the growth of SMEs in 1993-2013.

On the other hand, Balushi (2017) argues that it affected many sectors in Oman after the fall in oil prices. Long story short, Oman is the country whose income completely depends on petroleum products. Suddenly, the people who had been receiving oil subsidies were actually removed by the government in order to cover losses because of the dual effect, such as the countries that are members of the GCC. Many SMEs are not performing optimally and they delay the payment of capital loans. Of course, this decision made the Omani government increase service tariffs and harm SMEs.

Without exaggeration, we carefully prioritize the two hypotheses below.

*H1(c): The higher the OC level, the more positive MSMEs are.*

*H2(c): The higher the OC level, the more positive CEGS are.*

### 2.4. MSMEs

11

The term 'MSME' is already familiar to the public. Through the policies in the Law of the Republic of Indonesia number 20 of 2008, the government has outlined the definition and criteria of MSMEs. Herning et al. (2020), Berisha and Pula (2015), and Gilmore et al. (2013) revealed that MSMEs defined as individuals, small business entities, or households that run small businesses with assets or wealth, number of employees, and turnover limits per certain period.

Katua (2014) and Al-Abri and Rahim (2020) emphasize that the nature of large-scale businesses is not classified as MSMEs. Business entities carry the specifications for this business out with productive economies based on annual sales value or higher net worth than MSMEs, including foreign businesses, private or state-owned national businesses, and joint ventures engaged in economic activities in Indonesia.

Long story short, Adebayo et al. (2021) have investigated the causal relationship between environmental sustainability by factors of coal consumption in South Africa during 1980-2017. Follow-up investigations represent energy policies that entice consumers to switch to renewable energy. In terms of regulation, the government is trying to create and encourage small business actors to also take part in reforming the financial aspect through corporate social responsibility (CSR) programs to reduce more serious environmental degradation in the long and short term.

Siyal et al. (2014) emphasized that SMEs have played an important role in economic development in Pakistan. Long-term growth in the incubation of this sector is a key condition. The electricity crisis unexpectedly can shake SMEs. It is necessary to adjust the behavior of SMEs with the power supply development authority. In the future, at least there is a follow-up scenario to reduce the electricity crisis. In India, controversy over high pollution levels threatens the SME industry even though they contribute over 35 percent of direct exports and 15 percent of indirect exports. The danger is that SMEs in India do not have environmentally friendly and clean production methods, so there is no energy efficiency in SMEs (Naik and Mallur, 2018). Carbon emissions from SME industrial activities confirm dangerous practices and they are in danger of closing.

Without ignoring the role of SMEs in advancing the world of exports, it also concentrated research on the use of CC, EC, and OC incentives. Tactically, we speculate several hypotheses with the following details:  
*H4(a): The higher the CC level through the role of MSMEs, the more positive CEGS are.*  
*H4(b): The higher the EC level through the role of MSMEs, the more positive CEGS are.*  
*H4(c): The higher the OC level through the role of MSMEs, the more positive CEGS are.*

#### **2.4. Exports**

Kirpalani and Kleinschmidt (2016) accommodate the export theory explained with the relevance of new companies for review. The effectiveness of the company determines their determination and attitude in reclassifying the products of various proposed brands. The view that exports solve generates growth, which is marked by successful cooperation between various parties. intervened export initiation in developing countries. As in ASEAN, most interventions are microeconomic based, not macroeconomic in nature, because their targets are specific industries or companies. Countries that rely on and survive on export shares understand the importance of export insights and decisions despite the consequences that arise from export policies (Greenaway and Kneller, 2005).

At its peak, Safari and Saleh (2020) suspect the obstacles that prevent MSME businesses from expanding or entering export markets at the international level. The major problem in emerging markets (such as Indonesia) is the poor export capacity of MSMEs. Policy makers are more dominant in providing much help to them through subsidy programs. Ideally, the legal system and economic structure still play a role in providing training and facilitating trade. The uniqueness of the study of Shah et al. (2011) the uncommon response for SMEs, is clear in their potential to the economy in Pakistan. They concentrate their presence in labor-intensive sectors with high-wage regulations, so the trend of SMEs in Pakistan is towards overseas markets. In addition, comparatively competitive ensures that many small companies partner with SMEs to elevate the survival of the masses.

The occurrence of supply and demand creates a promising export strength. For that, theoretically, we want one of the following hypotheses:

*H3: The higher the MSMEs level, the more positive CEGS are.*

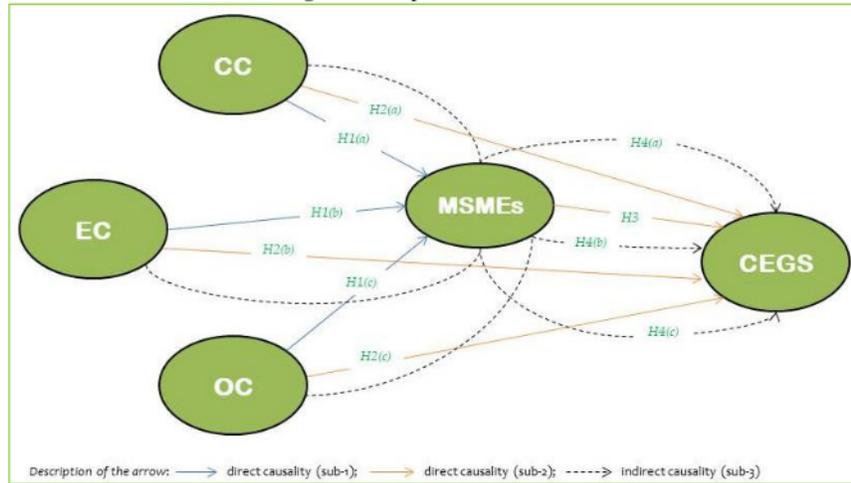
#### **2.5. Measurements**

After developing hypotheses, this session emphasizes synthesis focusing on five indicators (CC, EC, OC, MSMEs, and CEGs). We can see it from Figure 1, there are three patterns to answer the purpose of this research. The first pattern rests on three dimensions that affect MSMEs, including CC, EC, and OC. For the second pattern it comprises four dimensions that affect CEGS, including CC, EC, OC, and MSMEs. Finally, in the third pattern, it specifically predicts the role of MSMEs in influencing the relationship between CC, EC, and OC to CEGS.

Of these indicators, only two have the same unit of account and the rest are different. We set the study in two stages, namely testing seven direct relationships (H1a, H1b, H1c, H2a, H2b, H2c, and H3), then three

indirect relationships (H4a, H4b, and H4c). Operationally, all indicators also have different versions. It classified the consumption of coal and oil as fuel, while the consumption of electricity is energy.

**Fig. 1:** Conceptual and scenarios



Source: created by authors.

The Global Economy (2021) popularized the terms CC, EC, and OC to be used as comparisons between countries and global rankings in period to period trends. First, coal consumption comprises oil shale, brown coal, lignite, sub-bituminous, bituminous, sub-anthracite, anthracite, and includes net imports of metallurgical coke. Second, it described electricity consumption as the total net consumption of electrical energy got from electricity imports and total net electricity generation minus electricity distribution, transmission losses, and electricity exports. Explicitly, the net consumption in question does not include the energy used for generating units. Third, oil consumptions include bunkering, refinery fuel and losses, internal consumption, and if available, include direct combustion of crude oil.

Furthermore, the Indonesian Ministry of Cooperatives, Small and Medium Enterprises (2021) defines MSMEs into three parameters (micro, small and medium enterprises). First, micro-enterprises are defined as productive businesses owned by individual business entities or owned by individuals who are eligible based on the criteria. The turnover of this scale is at least IDR 300 million, with a maximum business asset of up to IDR 50 million (excluding buildings and land). Second, small businesses are defined as productive economic businesses carried out by business entities that are not branches or subsidiaries, are owned by individuals, or standalone, become part of, and are controlled directly or indirectly from businesses that are classified as large or medium, so that they meet the needs of the community standards implied in government regulations. Generally, small businesses have sales of IDR 300 million–IDR 2.5 billion per period and have a net worth in the interval of IDR 50 million–IDR 500 million per period. Third, medium-sized businesses are productive economic activities based on business entities whose ownership is not part of the company's branch, is carried out individually, and is established in partnership with large or small businesses. The classification of maximum sales turnover is IDR 50 billion per period and the minimum limit is IDR 2.5 billion per period. For net worth, the criteria for medium-sized businesses must be above IDR 500 million per period, excluding buildings and land.

Regarding exports, BPS (2021) proportions exports as the production output of all goods and services sold throughout the world and contributes to GDP. It represents the value of services, license fees, royalties, travel, transportation, insurance, shipping, and the value of merchandise. Special services, quite

varied, such as government services, personal business, information, finance, construction, and communication. Exports of goods and services exclude transfer payments, investment income (commonly referred to as factor services), and include employee compensation.

### 3. METHODS

#### 3.1. Design

We based the orientation of this research on quantitative techniques. Time-series data collected during the 2014-2020 period. We source data sets from relevant agencies based on their authority through annual secondary publications. The benchmarks in MSMEs and CEGS are percentages, while CC (thousand tons), EC (billion kilowatts per hour), and OC (thousand barrels per day).

#### 3.2. Econometric models

Path analysis applied to validate the data, then the data processing, was supported by SPSS 25 software (e.g. Roy et al., 2021; ZA et al., 2021). Path analysis is the development of multiple regression and is often applied to economic and business studies (Wijaya et al., 2021). Because the menu in SPSS is limited, specifically for the calculation of mediation (indirect effects), extra software used, namely the Sobel test (MacKinnon et al., 2002).

The data that has been selected changed and transformed into a simple form through natural logarithms. We adapt this assumption from Sohn and Trimarstuti (2019), Pescim et al. (2013), Thornton and Innes (1989). We summarize econometric parameters into three models (it structure direct path first, direct path is structured second, and it structured mediation pathway third). Therefore, three regression equation functions are arranged:

$$Y_1 = a + \ln b_1 + \ln b_2 + \ln b_3 + u_1 \quad (1)$$

$$Y_2 = a + \ln b_4 + \ln b_5 + \ln b_6 + \ln b_7 + u_2 \quad (2)$$

$$Y_2 = a + (\ln b_1 \times \ln b_7) + (\ln b_2 \times \ln b_7) + (\ln b_3 \times \ln b_7) + u_3 \quad (3)$$

Where,  $Y_2$  (CEGS);  $Y_1$  (MSMEs);  $a$  (constant/intercept);  $b_1, \dots, b_7$  (regression coefficients on CC, EC, OC, and MSMEs);  $\ln$  (natural logarithm);  $u_1, u_2, u_3$  (residue in each equation);  $x$  (relationship multiplication).

### 4. DATA ANALYSIS AND DISCUSSION

In detail, Table 2 describes descriptive statistics that vary among the variables that have been  $\ln$ . Following up on these results, CC with peak points in terms of range, mean, standard deviation, and variance were 0.66, 11.5529, 0.23020, and 0.053. The acquisition of three components (mean, standard deviation, and variance) in descriptive statistics that got the lowest score compared to the others were MSMEs of 0.15, 0.05350, and 0.003. This is in contrast to CEGS' achievement of the smallest mean score of 2.9943.

**Table 2:** Summary on descriptive statistics

	Range	Mean	Std. Deviation	Variance	N
Ln_CC	.66	11.5529	.23020	.053	7
Ln_EC	.36	5.3743	.13252	.018	7
Ln_OC	.22	7.3457	.09016	.008	7
Ln_MSMEs	.15	4.1357	.05350	.003	7
Ln_CEGS	.31	2.9943	.10326	.011	7

Source: SPSS output.

In order to see the closeness between indicators, one procedure is to use correlation. Table 3 deals with Pearson correlations involving bidirectional strength between CC, EC, OC, MSMEs, and CEGS. We can see that from the five indicators, only four of them are consistent and directly proportional to CC, EC, OC, and MSMEs. CEGS was the only indicator with a negative correlation, although  $p < 0.05$ .

**5**      **Table 3:** Position indicators in Pearson correlation

	<b>Ln_CC</b>	<b>Ln_EC</b>	<b>Ln_OC</b>	<b>Ln_MSMEs</b>	<b>Ln_CEGS</b>
<b>Ln_CC</b>	1	.982** (.000)	.865* (.012)	.972** (.000)	-.889** (.007)
<b>Ln_EC</b>	.982** (.000)	1	.893** (.007)	.967** (.000)	-.843* (.017)
<b>Ln_OC</b>	.865* (.012)	.893** (.007)	1	.949** (.001)	-.685 (.089)
<b>Ln_MSMEs</b>	.972** (.000)	.967** (.000)	.949** (.001)	1	-.862* (.013)
<b>Ln_CEGS</b>	-.889** (.007)	-.843* (.017)	-.685 (.089)	-.862* (.013)	1

Source: SPSS output; Note: \*\*Correlation  $< 0.01$  and \*Correlation  $< 0.05$ .

Extra procedures review whether the first structure and the second structure are workable to continue or not. Table 4 is an embodiment of the determination in the first structure that relates the CC, EC, and OC pathways to MSMEs with the gain  $F = 134.424$ ,  $p = 0.001 < 0.05$ , and coefficient  $R^2 = 99.3$  percent. This expectation result is more dominant than the second structure, where  $F = 10.860$ ,  $p = 0.026 < 0.05$ , and  $R^2 = 95.6$  percent. At a minimum, the output of both models is also worth maintaining. It also showed another harmonization by the Adjusted  $R^2$  value, which is useful for measuring and calculating each additional indicator. We concluded that the addition of the new pattern, in fact, improved this regression model extensively. The first model stands out more than the second model, where its Adjusted  $R^2$  gains 98.5 percent.

**Table 4:** Goodness of fit fit

	<b>F</b>	<b>Sig.</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>
1 <sup>st</sup> structure	134.424	.001*	.993	.985
2 <sup>nd</sup> structure	10.860	.026*	.956	.868

Source: SPSS output; Description: \* $p < 0.05$ .

From the first scheme, H1(a) was accepted and H1(c) was accepted because the coefficient is positive. However, H1(b) was rejected. Automatically, when EC increases, MSMEs decrease by 9.5 percent. Another representation, if CC and OC increase, then MSMEs increase to 18.4 percent and 28.1 percent with a significant long-term effect (see Table 5). For the next model, EC and MSMEs rejected the proposed hypothesis because H2(b) and H3 also rejected, so that when both experienced an increase, CEGS actually fell to 40.7 percent and 417.9 percent, respectively. Meanwhile, H2(a) and H2(c) was accepted, because CC and OC coefficients are positive. It can interpret this that the increase in CC and OC has a significant long-term impact on CEGS by 165.9 percent and 221 percent, respectively.

**22**

Specifically, specifically on indirect effects, CC and OC actually have a negative impact on CEGS through the capacity of MSMEs. The output of SPSS and Sobel test shows a negative coefficient, where the role of MSMEs seems to make CC and OC reduce CEGS insignificantly to 76.8 percent and 117.4 percent, respectively. However, MSMEs in the relationship between EC and CEGS can contribute significantly in the long term. With a positive coefficient, the effect of increasing EC through MSMEs has increased CEGS by 39.7 percent. We omit no path in the third model, because there is a positive effect. The regression estimate also explains if H4(a) and H4(c) was rejected, while H4(b) has been accepted.

**Table 5:** Regression estimation (direct and indirect effect)

Causality	B	T	Sig.	Std. Error	Remarks
CC → MSMEs	.184	2.951	.040	.062	+
EC → MSMEs	-.095	-.782	.491	.121	-
OC → MSMEs	.281	4.242	.024	.066	+
CC → CEGS	1.659	1.045	.049	.712	+
EC → CEGS	-.407	-.413	.720	.767	-
OC → CEGS	2.210	2.504	.018	.011	+
MSMEs → CEGS	-4.179	-2.420	.137	3.332	-
CC → MSMEs → CEGS	-.768	-1.155	.247	.665	-
EC → MSMEs → CEGS	.397	.665	.035	.596	+
OC → MSMEs → CEGS	-1.174	-1.203	.228	.976	-

Source: SPSS and Sobel outputs; Description:  $p < 0.05$ .

Logical reality is suggested by Suparjo et al. (2021), where the ‘green growth concept’ is an important component in evaluating the renewable energy mix, (including coal). Realizing sustainable development is the main thing that has been highlighted in the last few decades, they demanded it to prioritize social elements and optimize the economy.

In the USA, Craig (2016) inspired the role of energy efficiency and climate variability in the impact of power generation based on electricity sourced from carbon-emitting fuels. A total of 97.2 percent of carbon emissions in the electricity industry are channeled to housing by coal plants. As a result, residential electricity consumption continues to increase and results in high levels of greenhouse gas emissions. In the long term, the electricity reduction program has successfully intervened in household electricity consumption.

Of the 20 OECD countries selected during 1980-2011, the price elasticity based on the demand for oil in long-term income has a negative and positive elasticity. The feedback hypothesis drives a two-way causality from oil consumption to economic growth and vice versa (Özcan, 2015).

Action on this, Kurniawan et al. (2020) pioneered climate mitigation goals referring to the ‘Paris Agreement’, which urges the global need to minimize the use of new coal commodities. The electricity sector is growing in developing countries, including Indonesia, which is expansively using coal as the dominant fuel. In 1965-2017, as urban income increased, which was marked by the rate of urbanization growth, the demand for the energy mix continued to increase. From underestimation of the population causes the energy intensity of GDP to also increase. The greatest effect on coal consumption, considering socio-economic affects, accounts for the growing relative share of population increase in absolute terms. The commitment of residents in urban areas must separately address emissions from fossil fuels, especially coal.

Senarathne and Jayasinghe (2021) believe that there are weak consequences of policies in energy efficiency through environmental policies, so that market demand for economic activities in the African region is experiencing a decline. The good news, from Europe and the USA, which have implemented a tightening of energy use, supports Porter’s hypothesis. Those who are classified as developed countries are very concerned about environmental pollution issues without ignoring the economic aspect.

Michael and Araujo (1985) consciously criticize the theory of export behavior. There is a basic difference between internationalization and export in a country compared to behavioral models. By revamping the lessons, looking at opportunities, and problems in export behavior, they evaluated the implications for export management and government regulation.

Madushanka and Sachitra (2021) review that the deregulation applied by the government to make SMEs the backbone of Sri Lanka's economy has yielded results. In fact, the large-scale export expansion by SMEs is more because of increasing employment, increasing the value of production, reducing the trade balance deficit, creating a balance of payments surplus, and increasing capital inflows. The Sri Lankan government has taken an inclusive alternative approach through engaging them in export markets, strengthening financial literacy and management capabilities, providing linked access to market information, and revitalizing manufacturing.

Revindo et al. (2019) stimulated by survey techniques on the factors that influence the ability and decisions of MSMEs in Indonesia to engage in direct export activities. So far, trade liberalization has been uneven among companies and countries around the world. The position of SMEs in developing countries such as Indonesia is less competitive and takes part less in the export market than those with greater escalation. Export regulations in Indonesia still monitored by the government because link and match are hampered by the characteristics of the owners (exporters and non-exporters), their participation in export help, national network relationships, and other perceptions that hinder the export side.

Imran et al. (2017) mention the determinants of performing SMEs in exports in Pakistan. Investigative evidence in manufacturing companies yields four factors in the determinants of SME exports, including export market orientation, business network, total quality management, and entrepreneurial orientation.

16

## 5. CONCLUSION

This research determined to examine the relationship between coal consumptions, electricity consumptions, and oil consumptions on MSMEs and the contributors of exports of goods and services in Indonesia in the period 2014-2020. There are three empirical experiments that attempt to respond to the ten proposed hypotheses. Only five hypotheses have accepted and five hypotheses have rejected. The development of these hypotheses includes three parts. In the first structure, CC and OC have a positive impact on MSMEs, while EC does not. In the second structure, the consistency of CC and OC explained it, which also has a positive impact on CEGS. Meanwhile, in the third structure, neither of them has a positive effect on CEGS through MSMEs. However, it is precisely EC that has a positive impact through MSMEs to influence CEGS. Although some of these findings are anti-climax, it has proven the reality based on path analysis.

We expect the lack of research to be a reference for future studies, in order to consider the long term, sharpen the analysis, and expand the indicators that are closely related to MSMEs and CEGS. Referring to these results, several important policy implications suggested. The practical and academic implications of the findings are important to discuss in the future agenda.

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