IS BUSINESS FRIENDLINESS ENHANCING ENERGY CONSUMPTION IN THE ASEAN REGION?

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Abstract. Business friendliness on one hand is very crucial for healthy economic activity and at the same time it may have other impacts. In this study, the author has designed a complete research in order to find out the impact of three aspects related to business friendliness i.e. ease of doing business, cost of starting business and competitiveness on the energy consumption in ASEAN countries. To study this impact, the author has collected panel data from ASEAN countries comprising the time period of 30 years from the sources such as World Bank and Global Economy. The author has applied the tests such as unit root test, basic diagnostic tests, PCSE and GMM estimation approaches on the collected data in order to analyze the data and evaluate some results. The results obtained from these tests evidently show that all the independent variables, ease of doing business, cost of starting business and competitiveness have significant impact of energy consumption along with the control variable, per capita income. After the detailed results, the author has identified a few theoretical, practical and policy making implications and benefits of this study. After that, some of the limitations related to the study and the recommendation for improvement have also been given.

Keywords: business; enhancement; friendliness; ASEAN; evidences; consumption; energy; cost; competitiveness; ease of doing business; starting business


JEL Codes: O43

1. Introduction

The countries present within ASEAN countries experienced rapid increment in the consumption of energy during 1960 to 1980. A further increment was seen in the growth rate, which gave rise to the enhancing share to ASEAN countries in energy consumption. In year 1960, the total energy consumption of ASEAN countries was lesser than 0.5 percent (BeNhet & Harun). There is lower energy consumption within ASEAN countries when counted per head. The energy consumption within ASEAN countries is seen more dependent over the dependency on oil. In accordance with Charfeddine and Kahia (2019), oil accounted for around 90% of total energy consumption in the region in year 1980. Over the time period of twenty years, an increment was seen in the energy consumption to be five times more, from 10 million tons to around 60 MTOE (Boontome, Therdyothin, & Chontanawat, 2017). Within ASEAN countries, the use of primary electricity, natural gas and coal got incremented. However, a decline is seen in the
share of energy. In accordance with Gellings and Parmenter (2016), there is a significant importance of products of petroleum for the energy use in ASEAN countries. The rapid increment in consumption of energy was seen in ASEAN countries over the previous decades when the oil was major source of energy in the energy market of world. Therefore, the increment in requirements of energy was met through the given source of energy (Dibenedetto, 2011). However, the ASEAN countries did not go along coal era, as done by most of the other industrialized countries, before oil emergence (Hafeez, Chunhui, Strohmaier, Ahmed, & Jie, 2018). Usage of coal had been mainly developed within various industries even before the emergence of oil. However, the use of coal is also made in different ASEAN countries prior to oil penetration. There was low consumption of coal as compared to other non-commercial fuels like vegetable residues and wood. Basically, within ASEAN countries, oil work like the substitution of other fuels that are non-commercial (see Figure 1).

A significant progress has been observed within ASEAN countries in the context of ease of doing business. A significant progress of countries has been observed, therefore attracting more of the investments towards these ASEAN countries. In Figure 1, the ranking of ASEAN countries has been done in terms of ease of doing business. In accordance with Halder, Paul, Joardder, and Sarker (2015), Singapore is seen at the 2nd position, Malaysia at 9th position. Indonesia is at 73rd position, but managed climbing up to around 19 places from the ranking of year 2017. Despite of all good ranking, the region faces number of challenges when initiating some new business. More of the cost is involved in doing business in ASEAN countries. Some of the examples involve complex procedures, restrictive regulations and involvement of third party that add more cost pressures. Procedures being over regulated can also deter the activities of business and can open up more choices for bribes. Singapore is at the top when referring to competitiveness, in accordance with the Global Competitiveness Report of World Economic Forum, and at second internationally. Moreover, the other countries that have more competitiveness are Vietnam, Philippines, Indonesia, Malaysia and Thailand. In accordance with Huang, Mauerhofer, and Geng

![Ease of doing business](image)

**Figure 1.** Ease of Doing Business Ranking of ASEAN Countries
(2016), competitiveness gets derived through various factors like macroeconomics, technology, infrastructure, market efficiency and education.

Many of the researches have been done on energy consumption. However, there is no such research that mainly targets over analyzing that how energy consumption is enhanced from business perspective. Therefore, the aim of this research is to fill this gap in the literature. Moreover, this research will target the ASEAN countries that have not been explored in detail in the past. There are given research objectives of this study:

1. To analyze the impact of ease of doing business on energy consumption in ASEAN countries
2. To check the impact of cost of doing business on energy consumption in ASEAN countries
3. To determine the effect of competitiveness on energy consumption in ASEAN countries

This research will be helpful for the government of ASEAN countries through analyzing that what effect business friendliness can have over the energy consumption. The government can then develop different policies or regulations as required.

The structure of the given dissertation is Introduction, Literature Review, Methodology, Discussion, Analysis and then Conclusion.

2. Literature Review

2.1. Practice Theory

Practice theory is basically a theory that how social being having diverse intentions and motivates transform and make the world where the ones live in. In accordance with Karatayev and Clarke (2016), it is identified as the dialectic in between human agency and social structure that work back and forth. Practice theory basically shows the connection in between human action and on the other hand, it shows the connection with some other global entity, for instance some system. As this research basically aims to identify the link in between business friendliness with energy consumption (Shittu, Hassan, & Nawaz, 2018). The business friendliness basically involves various factors like cost of starting a business, ease of doing business and competitiveness. All of these are human actions (Hussain, Musa, & Omran, 2018). On the other side, a system is provided, the system is energy consumption. Therefore, in order to check the connection in between this dependent variable, energy consumption and independent variables, ease of doing business, cost of starting a business and competitiveness, practice theory can be used. This approach basically tries resolving the antinomy in between the approaches of traditional methods like methodological individualism that tried to define all of the social processes in terms of actions of individuals. In accordance with Kardooni, Yusoff, and Kari (2016), practice theory has become an important approach in interpreting the altering energy patterns.

2.2. Ease of Doing Business and Energy Consumption

The services of infrastructure, specifically electricity is considered as the major concern for businesses present around the world. The Surveys of World Bank Enterprise have identified that for doing business with ease, more of the resources are required, which results into the consumption of energy. For instance, for doing business effectively or to run any business, organizations are set up. The major requirements at the organizations can be fuel. The businesses mainly require more of the electricity as these organizations are required to remain open and lighted up. Therefore, it results into consuming more of the electricity. The services of infrastructure, specifically electricity is the major concern for the businesses working around the world. In accordance with Khan, Yaseen, and Ali (2017), Surveys of World Bank Enterprise identify that managers present within 109 economies, 71 of the economies of middle-income identify electricity as the major constraint for the business. However, in accordance with Longo et al. (2016), through the elimination of outages of electricity within ASEAN countries would make an increment in GDP by around 0.5 percent. Therefore, it is important for organization to have good quality and
A reliable supply of electricity. In addition to this, if the business is of transport, then in order to do this business with ease, different heavy vehicles are used that consume more fuel and oil. Based on this, it can be proposed that for doing business with ease, more of the energy is consumed. In such cases when businesses are not done with ease, instead of using electricity, sunlight is used. Moreover, the use of heavy automobiles is not preferred. On the other hand, when referring to the comfort and ease of business, the consumption of energy gets increased. This trend of doing business with ease is more noticeable within the ASEAN countries.

Based on the given analysis, the following hypothesis can be generated.

**H1:** There is a significant impact of ease of doing business on energy consumption in ASEAN countries.

### 2.3. Cost of Starting Business and Energy Consumption

Starting a business can involve more of the cost. Moreover, while doing the startup of the business, more of the resources are required, particularly in ASEAN countries. For instance, while in initiating a new business, more of the energy resources such as oil, fuel, coal, electricity and different other products can be used in order to construct the workplace. It can be stated that more cost is seen involved at the start of business, as compared to the settled-up business’ cost. In the start, more energy is consumed as to build up the workplace (Mofijur, Masjuki, Kalam, Rahman, & Mahmudul, 2015). This kind of energy consumption is done just in the start. However, the consumption of energy gets reduced with the passage of time. It is also ensured within ASEAN countries through following different practices. For instance, if simpler things are taken care of, then it actually helps in reducing consumption of energy. For example, turning off the lights and then making the monitor or computer turned off after using it. Turning these off at working day’s end can make a decrement in the consumption of energy. However, these are the measures that can be taken after the establishment of the business (Nezhnikova, Papeliuk, & Gorokhova, 2018). For instance, in the start, the business owner is required to make more investment in getting resources into the company. At the time of the starting of a business, the energy consumption gets increased and it can observe a decline with the development of business. Based on the given findings, following hypothesis can be proposed.

**H2:** There is a significant impact of cost of starting a business on energy consumption in ASEAN countries.

### 2.4. Competitiveness and Energy Consumption

When the costs of energy are expected to get increased over the twenty years, it is important to note that the innovation efforts of industry and offerings of services and goods will get directed towards such technologies that are more efficient in terms of energy. However, an increment in energy consumption in Western countries would be considered as detrimental to rise competitiveness for short-term in the ASEAN business market (Mirzabaev et al., 2015). The research of Rafindadi (2016) has identified that the trade-off terms of ASEAN countries has to confront to preserve the competitiveness for short-time period, and the required transformation of the comparative advantages of mid-long term. Dependent on the research of Shahbaz, Van Hoang, Mahalik, and Roubaud (2017), it has been analyzed that the export activities of ASEAN countries will result into a 10 percent increment in the consumption of electricity, as ASEAN countries would make a decrement in exports value by around 1.9 percent. Simultaneously, it will also make an increment in the cost of gas will decrease it by around 1.1 percent (Tang & Tan, 2015). The competitiveness loss is more noticeable for other larger exporters, specifically in such sectors that are based over energy. This short-term competitiveness has a negative influence with energy prices. The competitiveness can basically make the prices of energy products to get reduced (Zarsky & Tay, 2017). The decrement in the prices of energy products can let the individuals or organizations to consume more energy. Within ASEAN countries, increased competitiveness results into making the organizations to make a decrement in their costs, in order to make the customers to get attracted towards them (Zhang & Zhou, 2016). This basically outcomes into more consumption of energy because of competitiveness. Based on the given analysis, this hypothesis has been generated.
H3: There is a significant impact of competitiveness on energy consumption in ASEAN countries

3. Methodology

3.1. Data
Being the first and most important step of a research process, data collection has been conducted in order to be used in the research. The data which has been collected is panel data and has been collected from ASEAN region. This data covers the period of 30 years. The data bases used for data collection purpose include World Bank and Global Economy which are considered to be the most authentic and accurate sources for data collection purpose. The factors about which data has been collected include ease of doing business, cost of starting business, competitiveness and energy consumption. Next, the author has discussed the measurement units in the next portion.

3.2. Model Specification
The measurement units of all the variables involved in the current study have been discussed in this portion. The measurement unit of the dependent variable, energy consumption EC is billion kilowatt hours. In the same way, the independent variable, ease of doing business EDB is measured in terms of an index that ranges from the country where doing business is very easy to the country where doing business becomes difficult. In addition, the cost of starting business CSB is measured as the percentage of per capita income. The last independent variable, competitiveness COM has been measured in terms of World Economic Forum Index that ranges from 1 to 7. Apart from these variables, the control variable population growth PG is measured in terms of the number of people living in a country while the measurement unit of the other control variable per capita income PCI is taken as US dollars. Based on all the above mentioned variables, the author has generated the following equation or regression or model:

\[ EC_{it} = \alpha + \beta_1 EDB_{it} + \beta_2 CSB_{it} + \beta_3 COM_{it} + \beta_4 PG_{it} + \beta_5 PCI_{it} + \epsilon_{it} \]

In this equation, EC represents energy consumption, EDB represents ease of doing business, CSB represents cost of starting business, COM represents competitiveness, PG represents population growth, PCI represents per capita income while \( \epsilon_{it} \) shows the error term.

3.3. Estimation Procedure
Panel Unit Root Test
Unit root tests are used for the purpose of investigating and finding out the order of integration as well the stationarity of the variables before applying other tests and approaches on the collected data. The two tests i.e. LLC and IPS (Levin Lin Chu and Im Pesaran Shin) are most basic and important tests that are used for this purpose. However, based on the type of data collected, the author has employed LLC unit root test in this particular study. Among these tests, LLC unit root test provides homogeneous autoregressive process while IPS unit root test provides heterogeneous autoregressive process (Pesaran, 2004). As the traditional and conventional unit root tests resulted in some issues relate to size and power, these issues have been effectively resolved by IPS and LLC that are actually derived from augmented Dickey Fuller unit root tests. Both these tests involve the use of null and alternate hypothesis where null hypothesis indicates the presence of unit root and non-stationary state of the data while alternate hypothesis indicates the absence of unit root and stationary state of the collected data. The results of unit root tests are evaluated on the basis of these null and alternate hypotheses. As the author has used LLC unit root test, its equation is presented as:

\[ \Delta y_{it} = \alpha_i + \rho y_{i,t-1} + \sum_{j=1}^{p_i} a_j \Delta y_{i,t-j} + \epsilon_{it} \]

Here \( \Delta y_{i,t} \) is the difference that \( \Delta y_{i,t} \) shows for \( i \)th country for the specific time period of \( t \).
GMM and PSCE Approaches

The following general equation for the estimation of the variables can be used:

\[ Q_{it} = \alpha + \sum_{j=1}^{J} B_j X_{jt} + \sum_{j=1}^{J} \delta_j CEF_{aumj} + \sum_{j=1}^{J} \theta_j Y_j + \epsilon_{it} \]

In this equation, \( \alpha \) is the constant value, \( I \) represents the country, \( t \) represents the time or year, \( X_{jt} \) shows the explanatory variable, \( B_j \) is its coefficient, \( CEF_{aumj} \) shows the country fixed effect dummy and \( \delta_j \) is its coefficient.

As it has been clear from the equation that time fixed effect dummy has been used in the study. It has various benefits, the most important of which is that it will reduce the cross country regression because of time series and aggregate trends. This time fixed effect dummy also finds out any structural break if present in the data collected by the author. As the current study involves panel data, some basic diagnostic checks such as heteroscedasticity test, autocorrelation test, cross dependence test and multicollinearity test etc. These tests are used for various purposes such as to find out the heteroscedasticity of the variables, autocorrelation among variables, dependency of the variables etc. These tests are really necessary in order to obtain accurate and authentic results from the research (Blundell & Bond, 1998). The application of further tests is also depending on the results of these diagnostic tests. These points show the importance of basic diagnostic tests’ application on the collected data. The results of these tests have been given in the table 1. The results present in table 1 indicate that there is certain heteroscedasticity and autocorrelation among the variables. The cross-sectional dependence has also been found as significant. However, there is no multicollinearity found as significant in the collected data. The detailed results can be viewed in the table 1 below:

<table>
<thead>
<tr>
<th>Heteroskedasticity</th>
<th>Autocorrelation</th>
<th>Cross-section dependence</th>
<th>Multicollinearity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modified wald Breusch-Pagan/Cook-Weisberg</td>
<td>Wooldridge</td>
<td>Pesaran</td>
<td>VIF</td>
</tr>
<tr>
<td>( \chi^2 )-value: 10.85**</td>
<td>F-statistic: 6.49*</td>
<td>Test statistic: 2.959**</td>
<td>Mean VIF: 0.89</td>
</tr>
<tr>
<td>( \chi^2 )-value: 4.85**</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After getting the results of diagnostic tests, the next step taken by the author is the application of correlation test, the results of which are present in the table 2. According to the results present in the table, no correlation bias has been found among the variables and the collected data. The relationships present among various variables in the study are also evident in the results.

<table>
<thead>
<tr>
<th>Variables</th>
<th>EDB</th>
<th>CSB</th>
<th>COM</th>
<th>PG</th>
<th>PCI</th>
<th>EC</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDB</td>
<td>1</td>
<td>.648</td>
<td>.482</td>
<td>.492</td>
<td>.598</td>
<td>.294</td>
</tr>
<tr>
<td>CSB</td>
<td></td>
<td>1</td>
<td>.537</td>
<td>.395</td>
<td>.482</td>
<td>.593</td>
</tr>
<tr>
<td>COM</td>
<td></td>
<td></td>
<td>1</td>
<td>.593</td>
<td>.531</td>
<td>.483</td>
</tr>
<tr>
<td>PG</td>
<td></td>
<td></td>
<td>.492</td>
<td>1</td>
<td>.384</td>
<td>.584</td>
</tr>
<tr>
<td>PCI</td>
<td></td>
<td></td>
<td>.598</td>
<td>.482</td>
<td>1</td>
<td>.580</td>
</tr>
<tr>
<td>EC</td>
<td></td>
<td>.294</td>
<td>.593</td>
<td>.483</td>
<td>.584</td>
<td>1</td>
</tr>
</tbody>
</table>

As heteroscedasticity and cross-sectional dependence have been found in the collected data, to resolve these issues the author has applied two important tests i.e. GMM and PCSE estimation techniques. These techniques can be used in order to resolve the issues of heteroscedasticity and cross-sectional dependence. Moreover, very accurate and realistic results are obtained from the use of the above-mentioned tests or approaches. Before moving forward, it must be noted that both country fixed effect and time fixed effect have been used in this study. The basic assumption of PCSE test is that the results of this test involve the fluctuations which are actually the results of heteroscedasticity.
and correlations between the variables (Arellano & Bover, 1995). On the other hand, the use of GMM estimation approach has many benefits. The first point in this regard is that the endogeneity related issues can be resolved by using the lagged values of variables. In the same way, another benefit is that it joins together the regression in level series and regression in first difference series where the lagged values of dependent and explanatory variables are used as instruments of regression while the lagged values of explanatory variables are used as instruments of regression. Studies have shown that two types of GMM approaches are found i.e. system and first difference GMM approach. However, the author has preferred system GMM over the other one because the system GMM provides more accurate results as compared to the first difference GMM. GMM estimation technique may be used in accordance with the following equation:

\[ \vartheta_{it} = \alpha_i + \gamma \vartheta_{it-1} + \sum_{p=1}^{P} \beta_p \vartheta_{it-p} + \sum_{q=1}^{Q} \beta_q \vartheta_{it-q} + \sum_{r=1}^{R} \beta_r \vartheta_{it-r} + \epsilon_{it} \]

### 4. Empirical Analysis

#### 4.1. Results of Panel Unit Root Test

As the author had applied LLC unit root test in order to investigate and explore the order of integration and stochastic properties of the collected data, the results of this test have been presented in the table 3. The values for both the level series and first difference series have been given separately in the table. It can be observed that in the level series, all the variables have accepted the null hypothesis, but population growth has rejected the null hypothesis by one percent significance level. As most of the variables have accepted the null hypothesis, therefore it can be indicated that there is unit root present in the collected data while it is non-stationary. On the other hand, when the first difference is applied on the collected data, all the variables collectively reject the null hypothesis by either five or ten percent significance level indicating that there is no unit root and the collected data is completely stationary. These results can be summarized by stating that the data is non-stationary in the level series while it becomes stationary in the first difference series. Now that the order of integration as well as stationary properties of the collected data have been confirmed, the data is ready to be applied other tests and approaches in the research process.

<table>
<thead>
<tr>
<th>Table 3. LLC unit root</th>
</tr>
</thead>
<tbody>
<tr>
<td>onstructs</td>
</tr>
<tr>
<td>level</td>
</tr>
<tr>
<td>1st difference</td>
</tr>
</tbody>
</table>

In the table, ‘*’ represents the rejection of null hypothesis by one percent significance, ‘**’ represents the rejection of null hypothesis by five percent significance and ‘***’ represents the rejection of null hypothesis by ten percent significance

#### 4.2. Results of GMM and PSCE Approaches

The author has used GMM and PCSE approach of estimation after the application of unit root test and other basic diagnostic checks. The detailed results of GMM and PCSE both have been given in the table 4 of the study. In the results given in the table, it can be seen that ease of doing business has significant and positive impact on energy consumption according to both GMM and PCSE approaches. This means that with one percent increase in ease of doing business, energy consumption will increase by 19.4%. In the same way, the impact of cost of starting business has also been found as significant on energy consumption i.e. with one percent increase in cost of starting business, the energy consumption will increase by 23.8%. The last independent variable, competitiveness has been found as significant too and with its one percent increase, energy consumption is supposed to increase by 14.5%. Apart from these independent variables, the impact of one control variable, per capita income has been found as significant while the impact of the other control variable, population growth is found as insignificant in context of energy consumption. In other words, with one percent increase in per capita income, there will be 17.4% increase in energy consumption.
Based on all these results, it can be evaluated that ease of doing business, cost of starting business, competitiveness, and per capita income have a significant impact on energy consumption. That is, with the increase in these aspects, energy consumption will also increase and vice versa.

Table 4. Results from PCSE estimation

<table>
<thead>
<tr>
<th>Dependent Variable = QE</th>
<th>PCSE estimation</th>
<th>Sys-GMM estimation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDB</td>
<td>0.203** (0.659)</td>
<td>0.194** (0.678)</td>
</tr>
<tr>
<td>CSB</td>
<td>0.248* (0.385)</td>
<td>0.238** (0.496)</td>
</tr>
<tr>
<td>COM</td>
<td>0.159** (0.295)</td>
<td>0.145*** (0.689)</td>
</tr>
<tr>
<td>PG</td>
<td>0.053 (0.899)</td>
<td>0.051 (0.899)</td>
</tr>
<tr>
<td>PCI</td>
<td>0.180** (0.496)</td>
<td>0.174** (0.485)</td>
</tr>
<tr>
<td>Constant</td>
<td>5.375** (0.395)</td>
<td>2.474** (1.849)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.694** (0.875)</td>
<td>-</td>
</tr>
<tr>
<td>No. of observations</td>
<td>250</td>
<td>-</td>
</tr>
<tr>
<td>No. of instruments</td>
<td>-</td>
<td>248</td>
</tr>
<tr>
<td>No. of observations</td>
<td>-</td>
<td>248</td>
</tr>
<tr>
<td>Arellano-Bond test for AR (1) (Pr W z)</td>
<td>-</td>
<td>0.048</td>
</tr>
<tr>
<td>Arellano-Bond test for AR (2) (Pr W z)</td>
<td>-</td>
<td>0.978</td>
</tr>
<tr>
<td>Hansen test of overid restrictions</td>
<td>-</td>
<td>1.163</td>
</tr>
</tbody>
</table>

In the table, ‘*’ represents one percent significance, ‘***’ represents five percent significance and ‘****’ represents ten percent significance.

5. Discussion and conclusion

5.1. Discussion

The main purpose of this research study is to understand the impact of the business friendliness and its nature on energy consumption in the ASEAN countries. In this research, the focus is on the ease of doing business, the cost of starting business, and competitiveness and its impact on energy consumption. The ASEAN countries are known as the main regulators of energy and are trying to develop regional approaches for sustainable energy (Maulidia, Dargusch, Ashworth, & Ardiansyah, 2019). The ASEAN member states are now successfully implementing their regional strategy for sustainable energy supply. The business environment of the ASEAN countries focuses on the production of renewable and non-renewable energy such as oil, coal, and gas (Rasoulinezhad & Saboori, 2018). There is a large number of gas industries in the ASEAN countries combined with a positive environment that mainly supports expansion in private investment. The results and estimations have shown that population growth has an insignificant impact on the EC variable. Moreover, population growth has an insignificant impact on the other variables such as PCSE, SYS, and GM, whereas the other remaining variables have a significant impact on population growth. Through these results, it can be indicated that the friendliness of business can help in improving energy consumption. For example, Malaysia is well endowed with conventional energy sources such as coal, gas, and oil including renewable energy such as hydro (Williams, Raimi, Yarwamara, & Modupe, 2019). It has become a net energy exporter and conducting a strong business due to it which is enhancing energy consumption. Furthermore, the population growth and per capita income act as control variables in the research study whereas the results have been analyzed with the help of the GMM model and PCSE estimation.
5.2. Conclusion

To summaries the information, it has indicated that population growth has an insignificant impact on the consumption of energy. The main purpose of this research was to examine the impact of business friendliness on energy consumption in ASEAN countries. ASEAN countries are known as the main source of renewable and non-renewable energy; therefore, a large frequency of energy is being consumed due to business friendliness. The results and findings have been analyzed with the help of the GMM model and PCSE estimation. Moreover, the LLC unit root test has also been applied in the research study to indicate the results and findings. In this research, the control variables such as population growth and per capita income act have an insignificant impact on the variables in the study, such as SYS, CSB, etc.

5.3. Implications

The main implications of this research are related to the ASEAN countries, as they should know how the business is increasing energy consumption. This research has raised implications for energy supply and global environmental stability. This research can be used to diversify the energy mix to reduce the overdependence on certain energy sources and decrease the exportation of energy and finding different means of businesses. The high rates of oil and coal in the region are also increasing their needs. Being a net importer of natural gas, the consumption can increase in the coming years (Feijoo et al., 2018). If the production level of the ASEAN region did not increase, then the region will have to source out the additional demand from outside the region.

5.4. Limitations

Every study has its limitations. The following research study was based on the examination of business friendliness and its impact on energy consumption. The data was mainly collected from only a few states of the ASEAN region; therefore, it is recommended to the future researchers to select a large number of states in order to collect the information. Moreover, we only focused on the GMM model to analyze the results which are another limitation. However, future researchers can focus on a different one and choose another model for the estimation of results. Furthermore, the assumptions were made because of population growth for the reference scenario, and the growth rate was predicted through the UN department. The researchers in the future can use other means to collect data regarding population growth and income per capita.

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