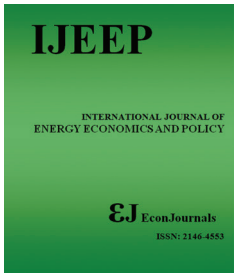

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Banking Development, Economic Growth and Energy Consumption in Vietnam

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ABSTRACT

This study is aimed towards assessing the role of banking development and energy consumption on economic growth in Vietnam for the period ranging from 1990 to 2019. The researcher has collected data on the variables from 1990 to 2019 related with banking development, energy consumption and economic growth. On the data collected on the specified variables, certain tests have been conducted. This research has used Stata as the statistical platform to carry out data analysis where descriptive statistics, Augmented Dickey Fuller (ADF), Bounds test, and Autoregressive Distributed Lag Model (ARDL) have been applied on the data. The results indicated that the data was non-stationary and had trend which can predict the future data. Based on this condition, ARDL test and Bounds test were applied. The results indicated that overall, the model was found to be significant. Individually, energy consumption had a significant impact in both short term and long term however, there was insignificant association among banking development and economic growth.

Keywords: Banking Development, Economic Growth, Energy Consumption, GDP, Vietnam
JEL Classifications: Q1, O13

1. INTRODUCTION

The process of reforming the monetary and financial system of Vietnam dates back to the time of state reunification in the country in 1976, however, mistakes and failures were made in the first period associated with the formation of a fundamentally new banking structure while maintaining the command and control system of management (Vuong, 2019). The main contradiction was that attempts were made to combine the financial independence of enterprises, the expansion of the sphere of internal market turnover and the decentralization of foreign trade while maintaining the directive planning system, state pricing, the state system of distribution of basic necessities and material and technical resources. Finance and credit served the fulfilment of the planned targets of the centre and provinces. The planning system was unable to withstand the spontaneously emerging proportions, was open to incompetent voluntary state intervention, and was costly and scarce in nature (Nguyen et al., 2019).

In part, the difficulties of encouraging domestic deposits, and, consequently, the acceleration of the development of the money market are overcome with the help of interest rates. The Vietnamese economy continues to operate primarily through cash (Tran, 2013). Achievement of sustainably high rates of economic growth, envisaged by the course of reforms, was due to the growth of domestic savings and investments, which were directed to the development of production and the growth of business activity (Suzuki et al., 2013). Monetary policy transformations included raising bank real interest rates to positive levels, stabilizing the national currency by devaluing the dong to the real value of the "shadow market," and establishing a flexible unified exchange rate (Busch, 2017).

The growth of the economy is mainly due to its decentralization and open-door policy, which actively attracts foreign investment, primarily from Taiwan, as well as Singapore and South Korea (Vo and Nguyen, 2012). Therefore, it is not yet clear whether Vietnam

will be able to build on its successes. Neighbouring China is becoming a more and more expensive economy, wages are getting higher, and we see that many industries are either about to relocate or are already moving to other countries in Southeast Asia. In 2018, Vietnam made significant progress in developing the country's economy. Its greatest achievement is the development of the gross domestic product (GDP) at about 7% (World Bank, 2020). This is the highest level of economic development in Vietnam in the 10 years since the 2008 global economic crisis. This result was achieved thanks to positive changes in various industries. A significant feature that subsidised to the development of the economy in 2018 was the further strengthening of the financial system (World Bank, 2020).

On the other hand, the problems of energy security of the world economy are basically allied to the level of technical improvement and progress in technologies for the production of goods, provision of services, the nature of transport, and the way of life of people on the planet (Kaygusuz, 2012). But the seven billion inhabitants of the Earth are divided not only and not so much by continents, but by the level of education, labour productivity and welfare (GDP per capita), by the structure of the national economy, by social structure and lifestyle. This division must certainly be taken into account when analysing the energy supply to the world economy as a single system (Omer, 2008). The level and dynamics of energy consumption are the most important characteristics of the expansion of the energy structure, just as the degree of monetary development is a key characteristic of the national and world economy (Zhang and Xu, 2012). The relationship between these two indicators for individual countries, regions and the world as a whole has for a long time been the subject of research by economists around the world who are looking for scientific confirmation of the existence of a causal relationship and determining its direction (Zhang and Xu, 2012).

The domestic financial market has changed positively towards a gradual decrease in its dependence on the banking sector and an increase in the part played by the stock market in the economy. The volume of bank loans provided decreased, but their quality and efficiency increased. Vietnam possesses significant potential for the enlargement of the electric power business, with large reserves of oil, gas, coal and hydropower resources (Karki et al., 2005). The power of the generated electricity increased from 2161.7 MW in 1991 to 21250 MW in 2010. The main producers of electrical energy are hydroelectric power plants (HPPs), thermal power plants with coal-fired steam turbine units and combined gas and steam turbine units (Nguyen et al., 2019). Energy shows a main part in the development of the current financial situation in Vietnam, primarily hydropower. Vietnam's hydropower potential is estimated at 84 TW / year, which is slightly less than the country's total electricity consumption (Canh, 2011). The hydroelectric power plant shows a chief part in the country's economic progress, providing about a third of Vietnam's total electricity demand (Nguyen, 2007). With respect to this description, this research paper is intended to answer the following question:

What is the influence of energy consumption and banking development on economic growth of Vietnam?

2. LITERATURE

For the economic expansion of the country, it is essential to stimulate and maintain the stability of economic growth because economic growth is called a dynamic aggregate an indicator characterizing the general state of the country's economy (Rodrik, 2008). Since the markets for securities and insurance services are underdeveloped in Vietnam, it is reasonable to assume that only the finance segment has a positive outcome on the volume of GDP (Dufhues, 2003), since the available borrowed funds help the population and enterprises to increase consumer and investment activity, which has a positive effect on production (Kooijman-van Dijk and Clancy, 2010). This relationship between the banking system and economic growth was first studied by Schumpeter, according to which the purpose of banks as monetary mediators inspires the economy to develop through effective capital redistribution (Schumpeter and Backhaus, 2003). However, low rates of economic growth are the main factor limiting the expansion of the finance structure whereas the high level of competition is an important factor in reducing the profitability of banks.

The finance segment shows a crucial part in the monetary expansion of all countries. At the same time, the formation of banking infrastructure, expansion of the range and increase in the volume of banking operations and services have a more significant impact on developing economies (Campiglio, 2016). The formation of a reliable and stable banking system with a wide range of services provided, taking into account the experience of more developed countries, can help to overcome income inequality and improve the living criterions of the inhabitants. In developing countries, the degree of coverage of the population with banking services shows an essential part in the expansion of the financial system (Hannig and Jansen, 2010). Since they lag behind the developed ones in terms of the number of ATMs and banking divisions, it is important for them to increase these values and increase the availability of banking services (Cracknell, 2012); (Endang, 2020); (Fu et al., 2019). At the same time, it is necessary to take measures to increase the capitalization of banks and reduce their costs. This contributes to an upsurge in the competence of the banking sector (as well as a decrease in the share of non-performing and ineffective bank loans in the total volume of issued loans) (Cracknell, 2012).

Achieving high efficiency remains a challenge for the first group of countries. The underdevelopment of the credit market and the lack of financial depth significantly limit opportunities related with fiscal progress (Caporale et al., 2015). The degree of development of the banking system may indicate the level of financial and monetary expansion of the country as a whole (Beck et al., 2010). Indicators such as the number of banks, capital adequacy, quality and quantity of bank credits replicate the efficiency of the finance segment (Beck et al., 2010). An increase in these values might be central to an upsurge in the degree of monetary development.

Vietnam has gradually made progress in developing infrastructure to support a modern banking system and financial markets (Anwar and Nguyen, 2011), projects have been developed to modernize the interbank system, create an international settlement system,

and admit external auditors to most Vietnamese banks, which have received approval from domestic and foreign bankers (Tram, 2012). However, the banking system continues to suffer from a lack of trust of potential depositors, a lack of experience in financial markets and a slow pace of reform (Tram, 2012). The central bank directs its efforts to fulfil its regulatory function. It is important and necessary for the Vietnamese finance structure to increase the confidence of depositors in banks (Demirgüç-Kunt and Klapper, 2013). The lack of trust can be easily demonstrated with this example: the population keeps 45% of their money in cash, and more than 50% of business transactions do not go through the banking system.

H_1: There is a significant influence of banking development on economic growth

The association amid energy intake and monetary progress has also been investigated theoretically by using diverse tactics. Within the neoclassical prototypes of growth, energy is regarded as the transitional contribution used for the purpose of production (Tsani, 2010). As per the study of Bartleet and Gounder (2010), the key proponents having the similar view consider that several mechanisms exist through which monetary progress can increase despite that there is a limited amount of energy sources available. The key explanation related to this has constructed upon the main notion of high-tech alteration as well as replacement of several supplementary physical contributions required for energy and to utilise the prevailing energy sources in an efficient manner. The purpose behind this is to create renewable energy sources that do not involve supply constraints (Binh, 2011). Bartleet and Gounder (2010) have also professed that it is significant to analyse whether the consumption of energy leads towards fiscal progress and whether fiscal progress can lead in the direction of energy consumption; in this way, whether there is a instrumental association amongst them. The key object behind this validation is the fact that it is challenging for various strategy creators to ratify the policies of energy preservation if a country has been an energy-dependent country. Therefore, if such relationship is existed, the structural policies can aim at decreasing the consumption of energy which can also lead towards slow economic growth.

The industrial period, often referred to as the period of extensive development or the period of cheap fuel, was characterized by exponential growth of the world economy, accompanied by a proportional increase in energy consumption (Li, 2015). The main stake was placed on energy conservation, supplementary comprehensive expenditure of energy possessions, development of nuclear energy, and replacement of oil with natural gas. As the key portion of energy maintenance, a course was taken towards operational restructuring of the economy with a decline in energy-driven manufacturing creation and an upsurge in the stake of the amenity segment (Stenqvist and Nilsson, 2012). This policy had its effect (Stenqvist and Nilsson, 2012). The energy intensity of the economies of oil-importing countries showed a steady downward trend, GDP growth began to exceed the growth in energy consumption (Loi, 2012). This is elucidated by the element that the main direction of the modern energy saving policy in the developed countries of the world is the restructuring of the economy with a decrease in the portion of energy-driven industries in the formation of GDP (Komal and Abbas, 2015). However, in the context of globalization of international trade, the reduction of energy-intensive industries in the developed countries of the world leads to their replacement in developing countries (Begum et al., 2015). On the other hand, the problems of energy security of the world economy are basically allied to the level of technical improvement and progress in technologies for the production of goods, provision of services, the nature of transport, and the way of life of people on the planet (Moreau and Vuille, 2018; Bekhet et al., 2017).

H_2: There is a significant influence of energy consumption on economic growth

The abovementioned Figure 1 highlights the main variables of this study with the help of the extensive review of previous literature. As mentioned in Figure 1, independent variables of this study include banking development and energy consumption, whereas economic growth has been taken as a dependent variable. In this manner, the key purpose of this research is to examine the impact of banking development and energy consumption on the economic growth of Vietnam.

3. METHOD

This section offers the description of the methodology as well as tool and techniques used for conducting this research. This research is based on quantitative research design which could offer statistical and numerical underpinnings within the data. According to Watson (2015), the use of quantitative design can provide the researcher exact and authentic results based on statistical tests and the justification and testing of the hypothesis. It has also been proposed that quantitative design is effective for implementing and using a large sample size and can also enhance the capability of the researcher to collect large amount of data on predefined variables. Therefore, in this research, the quantitative design has been adopted because of the variables of the research such as energy consumption; banking development and economic growth are quantifiable. Moreover, this design has allowed the researcher to further formulate the hypotheses on the basis of previous researches and by using real-time data, testing those hypotheses by using statistical testing and tools.

For the purpose of data collection, there are two types of data collection available for the researcher: primary and secondary. The secondary data collection has been employed in this research where data has been collected from different reports including World Bank, country and industrial reports. The researcher has collected data on the variables from 1990 to 2019 related with banking development, energy consumption and economic growth. On the data collected on the specified variables, certain tests have been conducted. This research has used Stata as the statistical platform to carry out data analysis where descriptive statistics, Augmented

Figure 1: Conceptual framework

Dickey Fuller (ADF), Bounds test, and Autoregressive Distributed Lag Model (ARDL) have been applied on the data. The following equation has been tested for this research paper:

$$EG = \alpha + \beta_1 EC + \beta_2 BD + \varepsilon$$

Where,
EG= Economic Growth
α = Intercept
β = Slope
EC = Energy Consumption
BD = Banking Development

4. RESULTS

This section of the paper presents and interprets the results obtained by evaluating the secondary data with the help of suitable data analysis techniques mentioned in the previous section. This study is aimed towards assessing the role of banking development and energy consumption on economic growth in Vietnam. Stata has been used as the platform to analyse data where descriptive statistics, Augmented Dickey Fuller (ADF), Bounds test, and Autoregressive Distributed Lag Model (ARDL) have been applied on the data.

4.1. Descriptive Statistic

In order to understand the data for the variables considered in this research, descriptive statistics have been derived. The following Table 1 shows the results:

Economic growth in this research paper is measured with the help of Gross Domestic Product (GDP), the mean value indicates that over the course of 30 years, the average economic growth of Vietnam was 6.79% and the value is deviated by 1.24 units as indicated by standard deviation value. The next variable if energy consumption which is measured by consumption of fuel in the region was used. The mean value indicates that on an average 50.6 and the value is deviated by 13.16 units as indicated by standard deviation value. The last variable used in the research model is banking development which was measured by commercial banks and others lending. The average value for this variable is found to be US$1120 million during the period of 1990-2019 and the value of standard deviation shows that the mean value is deviated by US$ 1980 million.

4.2. Augmented Dickey Fuller Test

For a time-series data, it is important to determine the existence or non-existence of stationarity. This can be done with the help of conducted ADF test which indicate if there is presence of unit root in the data or not. The results of this test are reflected in Table 2.

The null hypothesis for ADF test is that there is presence of unit root in the data which means that the data is non-stationary. To retain the null hypothesis, the p-value for the variables need to be above 5% or 0.05. For the variables considered in Table 2 that are: economic growth, energy consumption, and banking development the p-values are 0.10, 0.38, and 0.06, respectively. All the values are greater than 0.05 which means that the alternate hypothesis is rejected. Thus, the data taken into consideration for this research paper is non-stationary and has a predictable trend.

Table 1: Descriptive statistics

Variable	Obs.	Mean	Std. dev.
Economic growth	30	6.791768	1.242498
Energy consumption	30	50.64836	13.16962
Banking development	30	1.12e+09	1.98e+09

Table 2: Unit root testing

ADF- Unit root testing	t-statistics	P-value	Hypothesis
Economic growth	-2.552	0.1033	Rejected
Energy consumption	-1.786	0.3873	Rejected
Banking development	-2.750	0.0657	Rejected

4.3. Autoregressive Distributed Lag Model

The subsequent test shows that there is presence of unit root in all of the variables that are included in the research model, in alignment to this, ARDL model has been used to assess the impact of predicting variable on the dependent variable. According to Nkoro and Uko (2016), the causal relationship between two variables with non-stationary nature can be conducted with the help of ARDL model. While testing the effects of independent variable on dependent variable in an ARDL model, it is important to calculate lags of the variables included. There are two perspectives that can be assessed with the help of ARDL model, relationship in long run and short run. There are three levels upon which the significance of the impact is determined 95%, 99%, and 90%. The results of ARDL model are shown in Table 3 below:

In the first row of Table 3, the overall results of the model are shown. The significance of the model based on 95% significance level can be assessed based on the P-value which should be less than 0.05 or 5%. The p-value for the model under consideration is 0.002 which lies under the acceptable range. This indicates that both energy consumption and banking development significantly influences the economic growth of Vietnam. The coefficient value of the entire model is 0.48 which means that a unit change in energy consumption and banking development will bring about 0.48 units change in economic growth.

The next section of the table indicates the long-term relationship between the predicting factors of the model and criterion variable i.e. economic growth of Vietnam. Firstly, the impact of energy consumption on economic growth has been tested for which the P-value is 0.011. Considering that the value is less than the alpha value, in the long-term the impact of energy consumption on economic growth is found to be statistically significant. Furthermore, the coefficient value for this predictor is 0.08 which indicate that in response to a unit change in the predictor, economic growth will decrease by 0.08 units. Next, the impact of banking development on economic growth has been tested for which the P-value is 0.345. Considering that the value is greater than the alpha value, in the long-term, the impact of banking development on economic growth is found to be statistically insignificant.

The next section of the table indicates the short-term relationship between the predicting factors of the model and criterion variable

Table 3: ARDL model

	Coef.	Std. err.	t	P>|t|	(95% conf. interval)	
Economic growth	-0.4809765	0.13524	-3.56	0.002	-0.760732	-0.2012
LR						
Energy consumption	-0.0835438	0.03021	-2.77	0.011	-0.146041	-0.021
Banking development	1.76E-10	1.82E-10	0.96	0.345	-2.01E-10	5.52E-10
SR						
Energy consumption	0.1107152	0.05275	2.1	0.047	0.0015998	0.21983
Banking development	4.98E-10	2.66E-10	1.87	0.074	-5.19E-11	1.05E-09
_cons	5.120611	1.29547	3.95	0.001	2.44072	7.8005

i.e. economic growth of Vietnam. Firstly, the impact of energy consumption on economic growth has been tested for which the p-value is 0.047. Considering that the value is less than the alpha value, in the short the impact of energy consumption on economic growth is found to be statistically significant. Furthermore, the coefficient value for this predictor is 0.11 which indicate that in response to a unit change in the predictor, economic growth will increase by 0.11 units. Next, the impact of banking development on economic growth has been tested for which the P-value is 0.074. Considering that the value is greater than the alpha value, in the short-term, the impact of banking development on economic growth is found to be statistically insignificant.

4.4. Bounds Test

Bounds test was developed by Pesaran et al. (2001) in order to assess the presence of long-term association between variables, which is an approach of cointegration. This procedure is preferred over the conventional cointegration test because of the various advantages it offers such as it is applicable for series 1 or 0. Table 4 below shows the results of bounds test:

Table 4: Bounds test

	10%		5%		1%		P-value	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
F	3.42	4.546	4.265	5.564	6.337	8.045	0.002	0.008
t	-2.574	-3.236	-2.938	-3.641	-3.692	-4.477	0.014	0.058

The important values in the above table are P-values because they indicate the significance or insignificance of long-term association among the variables that are under study. All the p-values are considered significant as per 10% sig level which means that energy consumption and banking development are associated with economic growth in the long term.

4.5. Hypothesis Assessment

The following Table 5 gives a review of the hypothesis and their results based on the statistical tests that have conducted in the previous section.

Table 5: Hypothesis assessment table

S. no.	Hypothesis statement	P-value	Result
H_1	There is a significant impact of energy consumption on economic growth in the long run	0.011	Accepted
H_2	There is a significant impact of banking development on economic growth in the long run	0.345	Rejected
H_3	There is a significant impact of energy consumption on economic growth in the short run	0.047	Accepted
H_4	There is a significant impact of banking development on economic growth in the short run	0.074	Rejected

The results in the above Table 5 shows that both in long term and short-term energy consumption has a significant impact on economic growth in Vietnam. However, banking development in both long and short term does not impact economic growth. Nonetheless, collectively, the model was found to be significant.

5. DISCUSSION

Energy is a pivotal input which is used in all the different phases of production and is considered to be a significant resource used for increasing the welfare of societies. Consequently, it is considered to be an important determinant of economic growth for a country. From the assessment of the previous researches, there are certain studies that have found a significant relationship between the two variables. The long-term relationship between energy consumption and growth of the economy are vital for the purpose of determining the future growth and production (Begum et al., 2015). In alignment with the previous researches, the results of this research have shown that in the case of Vietnam, energy consumption has a long-term as well as short term association with the economic growth.

There is also significant amount of literature which has indicated an association between banking development and economic growth. According to the study of Campiglio (2016) banking sector plays a key role in the economic development of all countries. At the same time, the formation of banking infrastructure, expansion of the range and increase in the volume of banking operations and services have a more significant impact on developing economies. The results of this research have indicated that there is no significant impact of banking development on economic growth in the case of Vietnam. The findings of this research contradict with the stance presented by Hannig and Jansen (2010), in developing countries, the degree of coverage of the population with banking services plays an important role in the development of the financial system. This research has determined both the short-term impact as well as long-term impact however, in the case of Vietnam, both cases show insignificant results.

The assessment of the results of this research paper indicates that other than individual assessment of the predictors with economic

growth, the overall model was found to be statistically viable. It can be inferred from the findings of this research as well as the previous studies that countries must be careful in terms of their energy consumption because its effect is directly translated as the economic growth.

6. CONCLUSION

The primary objective of this study was to find out the impact of energy consumption and banking development on economic growth of Vietnam during the period ranging from 1990 to 2019. For the historic data, a range of statistical tests were applied on Stata to achieve the aim of the study. The results indicated that the data was non-stationary and had trend which can predict the future data. Based on this condition, ARDL test and Bounds test were applied. The results indicated that overall, the model was found to be significant. Individually, energy consumption had a significant impact in both short term and long term however, there was insignificant association among banking development and economic growth. Based on the findings of this study, it is recommended for the government of Vietnam and policy makers to pay close attention towards developing strategies that helps in attaining higher mobilisation of energy savings to gain confidence of Vietnam's investors, and also to attract the foreign investments in Vietnam. However, the energy consumption should be done in such a manner that it contributes to the welfare of country and society. Irresponsible consumption of energy can cause increase in greenhouse emission which in turn are bad for the environment. Future researches can be carried out to study the role of CO_2 emissions on economic growth.

6.1. Recommendations

This following recommendation are proposed based on the overall research outcomes:

- It is quite evident from the findings that financial developments and economic growth significantly increase the energy demand, thus consumption of energy is probably the most vital aspect for enhancing the country's economic growth. Based on this, it has been recommended to the policy makers to pay close attention towards developing strategies that helps in attaining higher mobilisation of energy savings to gain confidence of Vietnam's investors, and also to attract the foreign investments in Vietnam.
- It has also been recommended to the policy makers of Vietnam to must emphasise on developing and exploring domestic resources of energy to safeguard the country from any adverse external energy blow. This has played a major role in reducing the dependence of Vietnam on energy imports and strengthen the country's economic growth.
- The government of Vietnam has also been advised to introduce some important measures and reforms for strengthening the banking development, as well crafted and designed strategy for financial sector tends to strategize many other reforms supported by private and public sector development and stakeholders' partners.

6.2. Limitations and Future Research

There were certain limitations that have been associated with this study, which can be addressed in the future research to make an important contribution in the existing literature. The key limitation of this research has been linked with its limited scope, as researcher has conducted this study in the context of Vietnam, thus the findings and analysis presented in this study cannot viewed in another scenario or context. In this regard, future researchers are advised to widen the research scope by carrying out this study with the incorporation of more countries into the research investigation. This will help in providing a complete picture with more conclusive results about the research topic. On the other hand, the human perspective in the shape of qualitative data has also been missing from this study, as researcher has only followed quantitative research design to inquire about the association between the research variables. Hence, future researchers can consider conducting the same study with mixed research design to provide more conclusive results.

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