Master Thesis

Foreign direct investment in the power and energy sector of Bangladesh for economic growth

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The Graduate School of Hansung University

Major in International Market Analysis

Dept. of International Trade and Economics

HASAN MEHIDY

Master thesis

Advisor Professor InSeon Kim

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Abstract

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This study has tried to find major problems which are related to the study and the background of the study was discussed. The introduction chapter of the study has produced some objectives and aims from identifying the main problem of the study and it has also developed some research questions which would be answered throughout the study. The literature review chapter has found some key literature sources which has helped to study to find key variables that would be discussed in the methodology chapter and the study has also helped to find which methodology would be best for this type of study where some particular data should be taken on yearly basis. The methodology chapter has established a methodology which could be perfect for the study and this study would be helpful for developing the next study and it could help to build up the data analysis chapter to prove the significance of the study. The data analysis has tried to prove the selected hypothesis of the

study to show the significance of the study where positive results have been tried to identify. Conclusions and recommendations were given after the end of the study so that future researchers can get a direction while researching on the topic.

[Keywords] produced, identifying, developed, throughout, methodology, established, perfect, Analysis, significance, and recommendations.

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Chapter 1: Introduction

In the present situation, foreign investments have appeared as a significant factor in terms of the economic growth in any country. But foreign investments have been proved as the main source of economic growth in maximum developing countries such as Bangladesh, Pakistan and India. In this study, Bangladesh would be given as the main focus where Bangladesh is changing their economic policies by restricting hurdles on foreign trading and investments (Blackman, 2016). There are some reasons why foreign investments are helpful for Bangladesh. The first reason is that it can generate capital for a specific sector and secondly, it can also encourage domestic investors to compete with foreign investors.

Bangladesh is facing a crisis of energy and power for a long time and the nation is depending on developed and middle-east countries for importing power and energy elements. The crisis has become manifested in recent years as the nation has lack of access over power elements and it is costly to invest in this sector and electricity production is not enough for some urban rural areas that the nation can get 24-hour electricity service. In urban and rural areas of Bangladesh, the supply of gas is a major problem and the country is depending on supplying gas from foreign countries and people of Bangladesh are buying supply and cylinder gas at a high rate .

Therefore, a requirement for foreign investments is needed in the power and energy sector of

Bangladesh so that the nation can build its own power plant and supply of gas to remove its crisis of power and energy. In Bangladesh, the

power consumption is increased by 10% per year as the population is increasing. But Bangladesh has some limitations in its capacity of power and energy and the government has estimated that the supply of power and energy should be increased by 4 times more than its current consumption.

1.1 Problem statement

The power sector of Bangladesh can be an essential contribution in the economic growth and productivity. On the other hand, the growth of production can help in increasing the demand of energy in a country. Kathuria, Ray and Bhangaonkar (2018) reported that the level of energy consumption has a direct relation with the economic growth of a country. As the population of Bangladesh is increased in the last year, the more energy consumption would be required in the nation. Bangladesh is facing severe crisis of energy in rural areas as the energy is not producing according to the demand. Bangladesh is reliable to other countries for the consumption of oil and gas and the people of Bangladesh are buying these products at a high price where Bangladesh is facing debts while importing these products from Middle-east and European countries (Latief and Lefen, 2018). To control the crisis of energy, Bangladesh would require foreign investments to attain the debt level at a minimum stage for the power and energy sector. Therefore, Bangladeshi government should also show how they are going to use foreign investments in the sector to attain economic growth. This report would formulate a model which can show the positive side of attracting foreign investors to invest in the power and energy sector of Bangladesh (Mahbub and Jongwanich, 2019).

1.2: Primary suppliers of Power and energy and demand of energy

Value chains in power and energy sector can guide the overall sector because the demand of this sector has been heavily increased after 2010 because it created over-demand of power and energy due to the increase in population and usage of power and energy elements. The success of the power and energy sector is largely dependent on foreign investments as local investors haven't enough investment to invest in this sector. Some primary elements of energy and power sector in Bangladesh are coal, gas, petroleum and renewable energy etc. which should get proper attention to be increased.

Primary energy requirements should be given proper attention as this might be got neglected during investing FDI's in these sectors and it can create an imbalanced outlook. Some major suppliers of power and energy in Bangladesh are Electricity Generation Company Bangladesh Ltd., Ashugoni Power Station Limited, Independent power producers and SGS Group etc. They mainly supply oil and gas in Bangladesh where crude oil is supplied and the refinery company refines the oil for selling to consumers through oil and gas distributors (Mondal, 2010).

Bangladesh is heavily dependent on gas and oil and the nation is looking for its resources to meet its energy and power demand. But domestic resources of oil and gas are not enough to meet energy and power requirements of the nation. Therefore, Bangladesh imports crude oil from foreign countries such as the USA, Saudi Arabia and other middle-east Asian countries. But it took

1.3: Major constraints of power and energy sector in Bangladesh

1.3.1: Reliance on gas and oil

Bangladesh is heavily relying on the fossil fuels imports from foreign countries to fulfil its demand of gas and oil which are main determinants of the power and energy sector. The import of oil and fuel or gas is dependent on the international market price of oil and the price structure of gas. When the price of oil or gas is volatile in the international market, Bangladesh has to pay high costs for importing gas and oil because the country is highly depending on fossil fuels to meet requirements of producing energy. Bangladesh spends 50% of its total foreign exchange reserves in importing gas and oil as Bangladesh can't produce enough oil and gas for people of the nation (Mondal, Denich and Mezher, 2014). Recently, the prices of oil and gas has increased in the international market and it has created an impact on the oil and gas price of

Bangladesh and the demand of power and energy sector has been increasing in the country. Bangladesh didn't have enough foreign investment reserves which can cover the demand of energy such as oil and gas in the country.

Therefore, Bangladesh was requiring a high demand of foreign exchange reserves from foreign investors to fulfil demand of oil and gas as their prices were high. Therefore, the demand of energy and supply of energy has faced a huge gap and it has also increased the demand of foreign investments in the country. Bangladeshi government has followed a different choice of developing the current situation in fulfilling the increasing demand of oil and gas at lower prices. Bangladesh was also looking for an alternative energy which can decrease its reliability on oil and gas demand (Islam and Khan, 2019). Bangladesh is looking for

alternative energy sources such as solar projects, hydro projects and wind projects but energy producing from these projects may not be enough to fulfil demands of big industrials and societies.

Bangladesh is looking for new sources so that 5% of energy demand could be fulfilled from an energy source. Bangladesh has established some dams which can fulfil the demand of only 30% of energy demand in the country where the country is looking for foreign investments to import more fossil fuels from foreign countries (Cookson, 2020). Bangladesh only has two dams such as Kaptai Dam and Buckland dam but these two energy sources are not enough for the whole country because they can't produce enough energy and power.

1.3.2: Low capacity of production

Bangladeshi government has built many production units for producing energy in different places of the country. But the energy production capacity of these units is very de-rated and it is becoming lower month by month during the time period is going. There are some reasons that the energy production capacity of these units is going down which are mismanagement of energy and power sector, shortage of government funds, unavailability of oil and lack of proper maintaining of energy etc. Power producers of Bangladesh were capable of generating energy but they can't produce enough energy which resulted in severe load shedding in the country.

1.3.3: Threats and security concerns on energy sector

National production of gas and oil in Bangladesh are not sufficient and it has been predicted by experts that national reserves of oil and gas could be finished within the next 20-25 years and Bangladesh will be dependent on foreign imports of energy sectors. Therefore, to fulfil the

national demand of power and energy, Bangladesh imports oil and gas from foreign countries with large investments. But this situation has become a security concern for the country as Bangladesh has lots of resources where energy and power could be found but Bangladeshi government can't use it as large investments would be required (Alam et al., 2014). The main security concern for the sector is the international route of importing gas and oil because the international route could be demolished when there might be any global conflicts with different countries.

Seaports are the main transportation route during importing oil and gas and it could be dysfunctional in case of global conflicts between countries. For example, a conflict can be seen between Arabian countries such as Lebanon, Saudi Arabia, Iraq, Qatar and India and as a neighbour country of India, Bangladesh got also affected by their domestic relationship as Bangladesh imports oil from maximum Arabian countries. As a result, the entire electricity production system could be damaged due to the security concern of energy and power.

Bangladesh has some border conflicts with India and Myanmar and maximum oil and gas resources of Bangladesh are situated near the border of these countries. Therefore, a political riot or war could happen due to the scarcity of gas and energy resources. But a project of IndiaMyanmar–Bangladesh Gas Pipeline project has been established which are produced from

Assam Gas Field, Tripura Gas field and Sitwe Gas field where gas is supplied from Myanmar to Chittagong and Central India to several points of Bangladesh (Shahid, 2012). Bangladesh has also planned to import LNG from Qatar as the demand of LNG is increased and the country has to wait until December 2022 for the approval of imports.

1.4 Research objectives

- To find the relationship between energy consumption level of Bangladesh and FDI requirements
- To find the growth of GDP by contributing from FDI in the power sector of Bangladesh
- To find the importance of foreign investments in the power and energy sector of

  Bangladesh leading to economic development

1.5: Research questions

1. How foreign investments in the energy sector can lead to the economic development of Bangladesh?
1. How the growth of GDP can be increased from the foreign investment in the power sector?
2. How foreign investments in the energy sector can fulfil the demand of energy consumption in Bangladesh?

1.6: Rationale of the study

The findings of this research would reveal that expansion, real effective exchange rate, inflation, infrastructure, oil price, and FDI all have a positive and substantial relationship. Oil deposits, interestingly, have a considerable and bad effect on development; this could be due to the fact that nations with huge oil reserves, such as the GCC countries, have sufficient financial resources to fund their internal economic progress. As a result, governments impose limitations to preserve their resources, lowering the amount of FDI seeking resources. Furthermore, some commentators attribute the growth in domestic investments to the relative decline in foreign investment to the GCC from 2008 through 2013.

According to the UNCTAD (2019) research, investors have targeted major industries of the Bangladeshi economy over the years, including crude oil, estate development, communications, and consumer products. This is consistent with previous empirical FDI research on developing nations (particularly developing Asian countries), which found that natural resource assets have a significant impact on FDI. Previous empirical studies on the factors of direct investment in Bangladesh have concentrated on other industries rather than oil and gas. The oil sector has long dominated Bangladesh's economy, and it continues to do so. Policymakers have undertaken structural reforms to encourage more FDI and diversify the economy in order to achieve long-term economic growth outside of oil.

The existence of large global resources does not always lead to economic progress or prosperity, according to previous studies on the factors of resource-seeking FDI. This is in contrast to the belief that a country's natural resource endowment is a significant component of major revenue that boosts economic growth. In terms of Bangladesh, it is predicted that the availability of natural wealth will draw resource-seeking FDI, resulting in long-term economic growth; however the country has yet to attain such sustained prosperity.

Chapter 2: Literature review

This chapter would discussed on some existing studies which have discussed some major key points of foreign direct investment and the necessary of investment in the power and enrgy sector of Bangladesh. This chapter has identified key literature reviews on the basis of each identified variables of the study. Factors influencing multinational firms' decision to undertake FDI in the electricity industry can be classified into four categories based on existing literature: legislative, governmental, socioeconomic, and cultural implications. In certain research, specific aspects are identified as crucial, whereas in others, they are not.

2.1 Rationale of attracting FDI in Bangladesh

The study of Mondal, Jakaria and Hasan (2018) reviewed on their paper on the current scenario of the energy and power sector of Bangladesh and the establishment of energy security of the future. The paper of Khan and Islam (2020) discussed on the possibility of exploring the alternative energy of the power sector of Bangladesh such as solar power energy, biomass and hydroelectricity etc. According to Hassan et al. (2020), he focused especially on the oil and gas of the power sector and he found that the demand of power and energy is increasing in population due to its rising population. He analysed that oil and gas are the current demand in this sector of the nation.

According to Baky, Rahman and Islam (2019), he explored that foreign investment is a value created to obtain a long-term managerial stake in a company that operates in a nation other than the investor's own. Many countries promote FDI as a key part of their economic development plan. The preference for FDI is generally related not just with the capital

inflows it delivers to the targeted region, but also with the new technology, marketing, and managerial skills that FDI brings with it. Foreign direct investment (FDI) is thought to be critical to a country's economic development. International trade is facilitated by FDI, which complements domestic investment. Most Asian countries' efforts to attract FDI have tended to favour extractive industries and natural resources. Bangladesh as a country qualified to be a significant source of FDI into Asia due to its geographical natural resource and enormous market size, and Bangladesh is among the top five Asian countries that continuously receive FDI (Ruqaiba and Ishak, 2020).

The study of Neequaye and Oladi (2015) showed that Bangladesh's FDI stock has steadily increased times over the past 35 years, rising from $1.5 billion throughout the 1980s to $104 billion in 2017. Inflows of FDI, on the other side, have been rather steady throughout the same time period. Inflows of foreign direct investment, for example, have ranged from a peak of $7.4 billion in 2011 to a minimum of $3.1 billion in 2017. The trend line of Flow of FDI as a proportion of GDP in Figure 1 demonstrates that FDI input towards Bangladesh has been declining. These findings accurately represent the current state of Bangladesh's economic, social, legal, and cultural environments, as well as the levels of instability and political turmoil.

World Investment report (2020) figured that Bangladesh accounted for almost 20% of Foreign direct investment (FDI) in Asia in 2006 and 50% of FDI stock in the South Asia Sub region in 2007, but by 2017 these figures had declined to 11.27 percent of Foreign direct investment (FDI) in Asia and 21.51 percent of FDI stock in the South Asian Sub region, respectively. The annual average growth, on the other hand, is revealed to be approximately 12.5 percent and

62.17 percent, respectively. Bangladesh accounted for around 36.28

percent of FDI inflow in Asia in 2006, and 83.77 percent of FDI stock in the South Asian Sub region. In 2017, FDI inflows to Bangladesh fell to 8.36% of FDI Inflow to Asia and 31.9% of FDI inflows to the South Asian Sub region. This supports the preceding fact that Stock of FDI has consistently increased. Magazzino and Mele (2022) advocated that the 1996 structural adjustment program (SAP) prioritized and emphasized a move from the power and energy sector to non-energy sectors as a means of reducing Bangladesh's overreliance on the power and energy sector through economic diversification. Prior to the establishment of oil in Bangladesh, the SAP was mainly directed at reviving the farming industry, which had previously been the country's primary source of revenue. The agriculture industry provided more than 70% of the country's GDP by 1970.

Faisal and Islam (2022) reviewed that the government of Bangladesh has established some new policies so that the sustainable energy of the nation could be protected. They have discussed on different steps that Bangladesh will adopt in ensuring enough energy and power towards the vision of 2041. Mahbub and Jongwanich (2019) analysed the process of electricity generation by taking information of 36 mills, factories and industries by discussing their energy emissions and import-level of oil and gas. The journal of Debnath and Chew (2015) discussed on the requirement of foreign investments in the power sector to reduce the needs of electricity and gas in rural areas of Bangladesh. The report of International Trade Administration (2020) projected that the demand of electricity in Bangladesh would reach at 50,000 MW by 2041 and the country is expected foreign investments of $127 billion in the power sector by 2041.

Dunning and Lundan (2016) showed advantages of ownership allow companies and investors to move between regions and can even be

transferred to another country. For FDI to occur, the ownership advantage must be beneficial for integration by the business instead of the market handling transactions like selling or leasing. If the corporation does not have an internalization advantage, it will serve the international market through exporting rather than investing in order to manufacture locally. They added that there must be some types of location advantages that are peculiar to the geographical location and that would finally lead to actual investment. Low input prices, the availability of raw resources, and particular tax regimes are examples of location advantages that couldn't be moved to another location. The theoretical approach emphasizes market prosperity as the most important factor in determining where multinational corporations should locate.

2.2 Recent outlook on the power and energy sector of Bangladesh

According to Habib and Sarwar (2013), he explained that Bangladesh's economy still seems to be dependent on the energy and power sector twenty-seven years after SAP was introduced. The global drop in oil and gas prices, as well as changes in international oil and gas prices, have continued to expose the Bangladeshi economy to market volatility, causing structural disruption. The Bangladeshi economy was forced into recession during first half of 2017 as a result of the ongoing decrease in global power and energy commodity prices, compelling the Bangladeshi government to implement austerity measures, which impacted the living conditions of the majority of Bangladeshis.

The report of the Ministry of Power, Energy and Mineral Resources (2021) evaluated that

Throughout June 01, 2010 and June 30, 2015, total installed capacity climbed from 5823 MW to 13,540 MW, indicating a significant rise in electricity generation (Fig. 2). The population of the percentage with

access to electricity climbed from 48% in 2010 to 72% in 2015. Although per capita electricity use climbed from 220 kWh to 371 kWh, it remains one of its lowest in the world. The electricity sector in Bangladesh is primarily reliant on gas. Around 84 percent of installed power capacity was gas-based in 2010, with coal accounting for 4%, hydro accounting for 4%, and oil accounting for the remaining 8%. Gas-based installed capacity fell to 63 percent in 2015, due to conflicting demand and a continued supply shortfall. Coal and hydropower also played a minor role, contributing only 2% a piece, while imports accounted for 4% of power and liquid fuels accounted for the remaining 29%. The governmental sector contributed 52 percent of the total annual production of 11,532 MW in June 2015, while the private industry contributed 44 percent.

Alam (2020) described in his study that despite the fact that generation capacity has expanded significantly under the 6th Five-Year Project (2011－2015), electricity production prices have been rising in tandem with the power sector's ongoing operating deficit. The 7th Five-Year Project (2016－2020) handles those two primary concerns by focusing on low-cost and efficient electricity generation, depending so much on core electricity production rather than leasing, and shifting power imports to a regional basis, particularly with Bhutan, Nepal, Myanmar, and India. In addition, the principal fuel source has changed from gas to imported fossil fuels, with a slight increase in renewable energy sources such as solar and sources such as wind.

He also discussed that the electronics plants requires huge capital investments, which are out of reach for Bangladesh's governmental and private sectors. As a result, foreign investors have had a significant impact on the electricity sector. FDI inflows to the electricity industry climbed from $30 million (4% of total FDI inflows) in 2004－2005 to

$53 million (7 percent on average of total inflows of FDI) in 2010–2011, and to $208 million (10% of total FDI inflows) in 2015–2016. Although FDI inflows to the power industry have increased over the last decade, they remain low in comparison to other sectors such as gas and petroleum (Alam, 2020).

2.3 Casual relationship between energy consumption and foreign direct investment

Many studies have tried to identify relationship between energy consumption and foreign direct investment and how energy consumption could be a great factor in economic growth. Liu et al. (2016) developed a study by applying two step analysis of Granger method and Co Integration analysis in the study. They tried to relationship between the strength consumption and monetary growth of China from the period of 1953 to 2008 for 55 years. They found some issues in the short-run equilibrium but the result was effective during the long run equilibrium.

The authors found a single direction while exploring relationship between economic growth of China from foreign direct investment and energy consumption.

Latief and Lefen (2019) also explored from empirical researches that a causal relationship exist between economic growth and energy consumption level of in the UK. While trying to find the relationship between two variables economic growth and energy consumption from the period 1978 to 2008 for 30 years, Ma et al. (2016) found a positive relationship where labour force, economic output and capital stock were taken as independent variables. They applied the VECM model and Johansen Co Integration model to find the relationship between variables and they also found no causality between variables in the short run. Khan et al. (2021) took 74 countries to explore relationship between

energy consumption and economic growth and they found a single direction between variables and casualty in the long run.

The journal of Sinha and Kumar (2020) found that foreign investments are increasing in the power sector of Bangladesh every year and a total of $25 million has been invested in this sector in the previous year which has helped to generate 2000 MW electricity in private sectors only. The sources of Power Division (2020) have claimed that a total investment of $9 billion has been collected during the period of 2009 to 2018 among which $4.8 billion has been invested in public sectors and $4.2 billion has been invested in private sectors. Amin and Rahman (2019) claimed that $15 billion has been projected to be invested in the power sector by collecting investment from China, India and Russia. He also said that Bangladeshi government is making deals with Germany, Singapore and Malaysia and it is expected that investment would come from these countries in the power sector within 2022.

2.4 Economic advantages of FDI inflows in the power sector and its relationship with GDP growth

According to Dunning and Lundan (2016), he admitted that foreign Investment (FDI) is addressed and demonstrated to play an undeniably crucial role in global financial system, especially for low- and middle-income nations, which have received the majority of global FDI. Despite the fact that the money flows to the respective countries, researches have shown that the investment benefits both the home and investment countries primarily through transfer of technology flows and beneficial trade partnerships. Inward FDI flows benefit host countries in particular by bringing in new skills, technology, human and physical resources, as well as organizational systems and production patterns.

Dunning and Lundan (2016) addressed that the concept that the choice

in favour of FDI and the regional selection with such an investment are significantly dependent on the host country's conditions is almost unanimously acknowledged. Since the 1970s, the value and quality of public services, national facilities, and socioeconomic prospects of the home nation, political stability, and investment certainty have been considered the major catalysts for FDI attraction. According to Boateng et al. (2015), FDI is channelled to a place that provides for a market that decreases costs and risk while promoting competitive advantage. Energy has emerged as a powerful element of production in recent decades, complementing the other three primary productive resources: natural resources, capital, and labour. The demand for sustainable energy whenever it is required in the manufacturing process is a critical determinant of a company's profitability and capacity to maximize profits. Simultaneously, the power element of the pricing model of the manufacturing process is no longer insignificant or careless as it was previously.

The study of Hao et al. (2020), on the subject of energy supply reliability and security, developing countries, in particular, frequently experience frequent power outages that disrupt operations even for smaller manufacturers, and lawmakers have made significant efforts to control electricity usage and balance the country's energy supply capacity, such as in China.

Price variations in the electricity sector as a whole, as well as individual coal and electricity tariffs have impacted the scope of growth of countries like China. They added that the empirical findings on the contribution of FDI to fostering economic growth in underdeveloped nations have been conflicting, just like the theoretical perspective. The results of those researches on the link among FDI and GDP growth differ across nations based on their national tax policies, level of construction, including the

education of the labour force, and level of infrastructure. While some researches showed that FDI has no significant effects on GDP growth, a few come to the conclusion that FDI can only have a significant and positive effect when there is a global expansion.

In order to test the causation and look into short- and long-term linkages, several studies have looked at the relationship between FDI and GDP growth in South Asian nations. The connection is typically determined to be favourable, but the direction is sometimes unclear. For Bangladesh, Nepal, India, Sri Lanka, and Pakistan, Abbas et al. (2021) demonstrated the presence of a long-term link between FDI and GDP growth. With the exception of India, where the causality is two-way, the relationship between GDP growth and FDI in India is more of a one-way relationship.

2.5 The relation between consumer price index and FDI in energy sector

In earlier research, the price index has been employed as an indicator for a country's economic progress. This metric is thought to reflect the country's economic stability, which is supported by most prior research conducted outside. The majority of studies have found that this element has a positive impact on FDI attraction. BBS (2022) reported that consumer price index could be a good measurement to increase investments in the sector because CPI could determine the buying ability of customers in a country. For example, Bangladeshi people need lots of energy to meet their needs but due to lack of energy production, they have to buy energy at high prices.

Therefore, Kabir (2020) argued that consumer price index can affect the foreign investments in the sector because he believed that consumer price index may have negative relation with foreign investments in the energy

and power sector. No particular researches have been developed to prove the relation between consumer price index of Bangladesh and foreign investments in the power and energy sector. He added that CPI can also identify the inflation rate of a country and foreign investor could understand the current situation of inflation in a country to think before investing in a sector of a country such as Bangladesh.

The report of IMF (2021) reviewed that rising prices of energy sector has been caused due to rising prices of other commodities and it is a point of concern for Bangladeshi people that the energy prices would be higher in the future if they can't invest in their energy and power sector. Due to lack of funds, Bangladesh can't produce enough energy and the nation is looking for help from foreign countries such as the US, European countries, Japan and China to invest in their energy and power sector. As the consumer price index of the nation has gone down after the Covid-19, the inflation rate is going higher and the CPI inflation has gone past 5.50 points which Bangladeshi government tried to remain within 5.20 points. However, some countries have showed their interests to invest in the power and energy sector of Bangladesh due to high demands in the country where they don't look at the consumer price index or inflation of the nation.

Abbas et al. (2021) developed a study to find relationship between foreign investments and consumer price index and GDP of all nations of SAARC. He found that a positive relationship between FDI with CPI and GDP could be found but he found a negative relationship between GDP and CPI in maximum SAARC nations because foreign investors don't want to invest in a country which has high inflation rate. He applied the multiple regression models and he collected data within the range from 2001 to 2020 for 20 years.

The study of Falki (2009) showed that the impact of foreign investments in a sector with taking CPI, employment and GDP as dependent variables. He analysed that domestic variables have positive relationship with each other where he collected data from 1980 to 2005 and he used regression analysis to conclude that foreign direct investment has negative relationship with GDP growth but positive relationship with CPI.

Balamurali (2009) conducted a study on Sri Lanka to analyse the relationship between foreign investment and economic growth of Sri Lanka by taking data for the period of 10 years from 1996 to 2005. He also found positive relationship between foreign direct investment and economic growth where he took GDP, CPI and labour force as independent variables. But the result was different when he took a different industry of Sri Lanka and the result was negative.

Adam and Tweneboah (2008) explained by conducting FDI as an independent variable where he took consumer price index of Ghana as dependent variable. He tried to explore foreign investments in the nation and its relation with dependent variable CPI by analysing vector regression model and he found that high CPI in a country can have positive impact on the FDI of a country. He took the data from 1991 to 2006 for 15 years by using vector error correction model. Therefore, he concluded that positive relationship between CPI and FDI can create positive effect in the economic development of the nation.

Uddin et al. (2019) demonstrated the relationship between overseas direct funding and economic increase of Bangladesh by taking particular data from 1975 to 2005 for 30 years where he took employment, CPI and interest rate as independent variable for economic growth. He used the time series method by applying Ganger Causality testing on the model and they found casual positive relationship between overseas direct funding and economic increase Bangladesh.

According to Ilan (2017), he investigated the relationship between overseas direct investment and economic increase of the market of Indonesia and for the period of 1997 to 2006 of 10 years. He found that foreign direct investment has a positive relationship with economic growth where he selected variables for economic growth such as consumer price index, GDP and interest rate. He used sectorial data where he used Johansen Co Integration test to find relationship between variables.

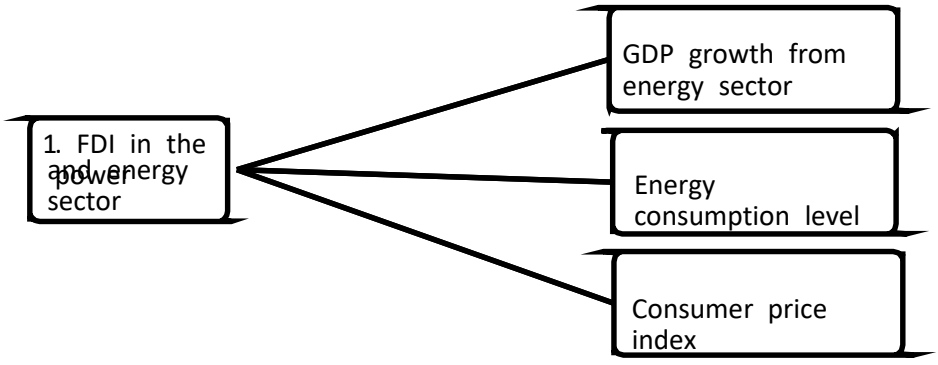
Chapter 3: Conceptual Framework

3.1 Research model

Independent variable

Dependent variable

(Economic growth)



3.2 Hypothesis testing

H1: There is a positive significant relationship between FDI and GDP growth in energy and power sector

H2: There is a negative significant relationship between FDI and the increase level of energy consumption

H3: There is a positive significant relationship between FDI and consumer price index of Bangladeshi people

Chapter 4: Research Methodology

The research would be based on the panel data analysis where the researcher would apply the time series methodology for evaluating the study. Here, the researcher would collect a series of data related to its two variables such as dependent and independent.

4.1 Research approach

Two types of research approaches can be seen in different studies such as inductive approach and deductive approach. For the study, the inductive approach would be undertaken as the study would evaluate new findings and new data for an existing study. Inductive approach starts with specific interpretations and progresses to more general assumptions and ideas. As the study continues through the investigation using an inductive reasoning, it tends to create empirical generalizations and identify preliminary links (Liu, 2016). At the beginning of the research, no hypotheses could be established, and the study is unsure of the type and character of the study results until the research is finished.

It is critical to highlight that using an inductive method does not mean ignoring concepts when developing research aim and objectives. The inductive research approach focuses on generating significance from the set of data for achieving the appropriate trends and regularities in order to construct a hypothesis; however, the inductive research approach does not deprive the researcher from formulating a research topic to be investigated using established theory.

4.2 Research technique

The panel data analysis technique would be used in the study where the study would collect related information for particular years. The analysis of data would show which analysis could be done on this particular study and which statistical techniques would be used for proving the hypothesis. For example, data analysis technique such as unit root test and statistical equation would be used in this study. Following techniques would be used in the time series analysis of the study.

Unit root test: In time series analysis, a unit root test is used to determine if a time series is stationary or not. The null hypothesis is defined by the absence of a unit root in a time series, while the alternative hypothesis is defined by the presence of a stationary in time series. The ADF method is a standard significance test that provides findings for alternative or null hypothesis in hypothesis tests. As a consequence, the study will get a p-value out of which they would need to determine whether the series of time series is stationary or non-stationary. If a time - series data is non-stationary, the time values will likely to give a standard error or a deterministic trend (Choi, 2011). If the variables are stationary, simply an incorrect factor or predictable trend will be returned. A high value likely to be accompanied by low values in a stationary series, and a negative sign seems to be preceded by a specific value.

Multiple regression method: The following principles explain the multiple linear regression models:

- The relationship within the independent variable and dependent variable has a linear relationship.
- The variables of independent term are not overly connected with one another, and the observations are chosen at random from the population.

- The residuals should have a normal distribution with a mean of zero and variance of one.

The R-squared is a statistical tool for determining how much co-efficient in the variation in the independent factors can be described by variance in the outcome. Even if the variables are unrelated to the dependent variables, R2 always rises when additional variables are introduced to the multiple linear regressions.

4.3: Qualitative or quantitative

For the particular study, the quantitative method would be used as statistical analysis would be done through using an equation where the equation would prove the testing of hypothesis that the hypothesis is right or wrong. The statistical approaches used to acquire information from research study are generally used in quantitative outcome in sociological research. Researchers and analysts use quantitative structures and ideas related to the quantity in issue in this research methodology (Khare and Burris, 2010).

4.4: Sample size and sampling technique

The study will apply the time series method where the researcher has chosen to select the data of the last 25 years from 1996 to 2020, as the data of energy consumption level is not available in the government portal after 2020. After collecting the data, the study has chosen to apply an equation which can help in finding the result of the study. To select the sampling technique for the study, panel sapling has been applied by taking a specific data set for specific years.

4.5: Data collection process

To collect data on each variable, the level of FDI in the energy sector would be collected from the report UNCTAD and Bangladesh Bank. To collect data on the GDP growth, the report of World Bank should be used (Cryar and Chan, 2018). In terms of collecting the data on energy consumption level in Bangladesh, the report of Bangladesh Energy Market Report and government portal report. To collect consumer price index of the nation, the study has collected data from the World Bank report for Bangladesh.

4.6: Data analysis method

In achieving the main objective of the thesis report, the secondary research methodology has been selected to be applied where the study will collect the secondary data. In terms of collecting data from the huge database, the study has chosen dependent and independent variables where foreign investments in the energy and power industry, GDP growth and the level of energy consumption have been chosen as main variables. The equation model is –

$$\ln FDI = \beta 0 + \ln GDP\ \beta 1 + \ln EC\ \beta 2 + \ln CPI\ \beta 3 + \varepsilon$$

Where,

β = intercept slope

FDI = foreign investments in energy and power sector

GDP = GDP growth from the power and energy sector

EC = the level of energy consumption

CPI = Consumer price Index

ε = error term

To analyse the data, the study will apply the unit root test to find the positive or negative relationship between both variables of independent and dependent. To find the stationary and non-stationary test, the method of Dickey Fuller model test would be applied and Newey model would be applied to find causality direction between variables such as GDP, foreign investments consumer price index and energy consumption. To find results of the study, the researcher has used software such as STATA 14.2 and Microsoft Excel.

Chapter 5: Data analysis and results

5.1 Descriptive statistics

The table summarizes the descriptive statistical analysis for each model variable and the estimated value of FDI is 280.31, with such a deviation level of 140.37, indicating that FDI values vary widely. FDI has a minimum value of 66.82 and a highest amount of 494.5. The average energy consumption usage is 18.28, with such a deviation level of 16.91, indicating that the figures are less variable. Energy usage has a minimum value of 8.98 and a max value of 26.98. The mean GDP value is 48.04, with a standard deviation of 33.51, indicating that GDP numbers vary significantly. The GDP has a minimum value of 2.66 and a high value of 133.77. The mean value of consumer price index is 5.42 where the standard deviation of CPI is 2.73. The minimum value of CPI is found as 1.3 where the maximum value of CPI is known as 11.4.

Table 1: Descriptive statistics

Variables	Units	Mean	Median	Std. Deviation	Minimum	Maximum
FDI	Current USD in billion	278.70	280.31	140.37	66.82	494.5
GDP	Current USD in billion	48.04	47.61	33.51	2.66	133.77

EC	Per capita	18.28	16.91	5.53	8.98	26.98
CPI	In points	5.42	5.7	2.73	1.3	11.4

5.2 Unit root testing

5.2.1 Stationary test using Augmented Dickey Fuller method

In this research, the study will have to go through Dickey – fuller (ADF test), which is one of the most frequent statistical tests for determining whether or not a time series is stable. When it comes to examining the constant of a series, the ADF currently is the most frequently employed statistical test. In time series, the term "stationary" is particularly significant. Since a model could predict on non-stationary of time series analysis, the first stage in Ordinary least square (OLS) time series analysis is to detect the number of 1st difference takes to create the series stationary. Let's try to get a better understanding of what's going on. To conduct the stationary testing of all independent and dependent variables of the study, augmented dickey fuller method has been applied (Hayes and Matthes, 2009). The method proves that the data which has been selected are stationary or non-stationary. Here, the model applied that test Statistic 〈 Critical value at 1%, 5%, or 10% or P-value 〈 α value.

dfuller fdi, trend lag(6)

Augmented Dickey-Fuller test for unit root Number of obs = 19

Table 2: ADF Test FDI

Test Statistic Z(t)	1% Critical Value	5% Critical Value	10% Critical Value
−3.402	−4.380	−3.600	−3.240

MacKinnon approximate p−value for Z(t) = 0.0511

The ADF method showed that Therefore, as the t statistic value is more than 10% critical p value, the data is stationary.

Stationary test for GDP:

dfuller gdp, trend lag(2)

Table 3: ADF Test GDF

Test Statistic Z(t)	1% Critical Value	5% Critical Value	10% Critical Value
−4.793	−4.380	−3.600	−3.240

MacKinnon approximate p−value for Z(t) = 0.0005

Therefore, as the t statistic value is more than 1%, 5% and 10% critical p value, the data is stationary.

Stationary test for EC:

dfuller D_ec, trend lag(0)

Dickey−Fuller test for unit root Number of obs = 23

Table 4: ADF Test EC

Test Statistic Z(t)	First difference	1% Critical Value	5% Critical Value	10% Critical Value
−3.727	8.97	−4.380	−3.600	−3.240

MacKinnon approximate p−value for Z(t) = 0.0207

Therefore, as the t statistic value is more than the critical value of p value at 5% critical value and 10% critical value, the data of EC is stationary at the first difference of 8.97.

Stationary test for CPI:

dfuller cpi, trend lag(9)

Augmented Dickey−Fuller test for unit root Number of obs = 15

Table 5: ADF Test CPI

Test Statistic Z(t)	1% Critical Value	5% Critical Value	10% Critical Value
−3.986	−4.380	−3.600	−3.240

MacKinnon approximate p−value for Z(t) = 0.0092

Therefore, the data is stationary as the critical value at 5% and 10% is less than the statistic value of t.

5.3 Regression testing

5.3.1: OLS regression testing

Multiple regression analysis

Table 6: OLS Regression

Regression Statistics	
Multiple R	0.96
R Square	0.92
Adjusted R Square	0.91
Standard Error	42.35
Observations	25.00

	Coefficients	Standard Error	t Stat	P-value
Intercept	-104.61	40.10	-2.61	0.02
X Variable (GDP)	1.26	0.53	2.40	0.03
X Variable (EC)	14.55	3.07	4.74	0.00
X Variable (CPI)	10.48	3.66	2.86	0.01

5.3.2 ARCH model

Sample: 1996 - 2020	Number of obs	=	25
Distribution: Gaussian	Wald chi2(3)	=	202.46
Log likelihood = -126.5131	Prob > chi2	=	0.0000

Table 7:ARCH Model

fdi	Coef.	OPG Std. Err.	z	P>|z|	[95% Conf. Interval]	
gdp	1.22	0.50	2.44	0.01	0.24	2.20
ec	14.5949	3.709306	3.93	0.000	7.324793	21.86501
cpi	9.61	3.77	2.55	0.01	2.22	17.00
_cons	-103.71	45.89	-2.26	0.02	-193.66	-13.77

ARCH |

arch | L1. |	.17	.23	0.71	0.48	-.29	.63
_cons	1258.40	395.43	3.18	0.01	483.37	2033.43

The ARCH model has been developed for the regression analysis to show that there is a serial relation between variables or not. If the p value is more than 5%, it will estimate that the model is not serial and significant. But from the result, it showed that the p value is 0.01 which proves that ARCH model has a serial correlation between variables.

5.3.3 Regression with Newey-West standard errors

Number of obs = 25

F(3, 21) = 101.35

Prob > F = 0.0000

Table 8: Newey-West Standard Error

fdi	Newey-West Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
_cons	-104.61	34.985	-2.99	0.01	-177.367	-31.855
gdp	1.26	0.616	2.05	0.05	-.0203	2.539
ec	14.55	2.888	5.04	0.00	8.545395	20.556
cpi	10.48	3.479	3.01	0.01	3.241	17.711

Chapter 6: Discussion

6.1: Summary of results

Between 2000 and 2008, Bangladesh experienced a large increase in FDI inflow, particularly in the electricity and power sector, which benefited the nation's overall construction and strategies and procedures. Manufacturing received the biggest portion of all FDI inflows between 1996 and 2010, followed by the transport and energy sectors (Appendix). The periods between 2012 and 2017 and 2015 and 2017 had the biggest flows of FDI. However, the FDI flow has been declining since 2018, which appears to be a big problem for the growth of Bangladesh's energy and power sector.

Simple OLS regression and Newey-West regression model has been applied to show significant and insignificant results of hypothesis to show that selected hypotheses are null or alternative. The confidence interval of 95% has been applied in each variable to check null or alternative hypothesis. The hypothesis is accepted and significant when the value is from 0.01 to 0.05 and it is and it is non-significant when the value is more than 0.05. The descriptive statistics show that the result of R square is 0.91 which is quite good and the result of adjusted R square is 0.91 which is also quite normal.

The regression result showed that foreign investment in the energy and power sector by 1 million would increase the GDP of the country by 1.2 million US dollars. When CPI of the country would increase by 10.21 levels of score, it could also increase the foreign investments of the country in the power and energy sector. Some issues could be found in OLS results of the study as the study is developed based on the panel data.

The result of the coefficient in OLS model showed that the sign of GDP which is determined by $\beta 1$ is positive as the result is 1.26. It means that if the GDP of the country is increasing by 1.26 billion US dollars in a year foreign investments in the country would be increased by 1.26 billion US dollars in a year. The economic trend of Bangladesh is different from other countries and the effect of GDP, CPI and EC on foreign investments of the country is also different (Noreen, 2018). Though the economic condition of Bangladesh is growing, the economic growth rate is going down in the country due to the corruption and foreign countries lose interest to invest in the power sector of Bangladesh. The overall performance of regression models using OLS method are satisfactory in terms of the variable of growth domestic product and consumer price index and independent variable such as GDP and CPI are statistically significant with the dependent variable FDI. But electricity consumption variable is not statistically significant with variable FDI at the level of 5% and 1%. R square of random effects model showed that the total performance of all variables is strongly presented in the study. This model suggests that the coefficient of the determination is 78% which indicates that 78% of independent variables have been explained by dependent variables. Therefore, the significance of OLS model prove that foreign investments in the power and energy sector can improve the GDP growth and CPI of the country which has been explained by OLS model.

The expectation on CPI variable of $\beta 3$ was very low, but the result of coefficient is positive as it is statistically significant with dependent variable FDI. If the coefficient of the parameter total value is increased by one point then the CPI would increase by 10.14 point for people of Bangladesh as OLS regression has showed that. The theoretical model showed that the great contribution of GDP in power sector can influence

foreign investors to invest in the sector. The coefficients of regression model showed that EC has a negative position in the study as the coefficient is −14.55 and it was not expected that energy consumption level would be negative (Hayes and Cai, 2007). Therefore, it proves that high foreign investments would require increasing average energy consumption in Bangladesh.

One level increase of EC can increase the FDI contribution of the nation by 14.41 million US dollars. During investing in the energy and power sector, foreign investors would investigate the energy consumption level of people in Bangladesh. High energy cost and low quality of energy services in Bangladesh may change the decision of foreign investors. Therefore, better level of energy consumption can increase the possibility of attract foreign investment. The energy consumption level is very low in the country in terms of the population of the country.

6.2: Interpretation of each result

The main objective of the study was to find relationship between foreign direct investment in the energy sector and its contribution in the economic growth of Bangladesh. Results showed that there is a positive relationship and all objectives of the study were fulfilled. The study has also found that there is a positive relationship between GDP growth and foreign direct investment which means that increase of FDI in the sector could increase the GDP growth of Bangladesh. In the study, dependent variables of the study were foreign direct investment in the power and energy sector of Bangladesh and economic growth was independent variable and its indicators were GDP, energy consumption and consumer price index. This aspect is seen as particularly important in attracting foreign direct investment into the electricity sector. The Bangladeshi market has done well by any metric, according to both governmental and

private respondents. Many respondents felt that the country is prioritizing infrastructure development, particularly in the power sector, where major capacity enhancements have been realized, mostly through private sources, attracting foreign investment.

Energy resources are not given much consideration in the prevalent macroeconomic model of economic growth in the study. Energy was regarded as a middle input in the idea of production and growth and energy resources play no part at all in the fundamental economic growth model put in this study. Results of the study have emphasized the importance of energy as a prerequisite for economic output. Energy availability drives economic expansion rather than causing higher energy demand. Since all production requires the change or movement of matter, both of which require energy and the study views energy as a crucial component of production. Studies have attempted to identify the linkages between FDI in the energy industry and economic growth by looking at the relationship between energy use and economic growth. This suggests that higher GDP would result in more energy being used and results demonstrate that over time, economic activity contributes to energy consumption. The OLS regression test also demonstrates that for Bangladesh, there is a directional causal relationship connecting GDP to energy use. This implies that energy use promotes economic growth in Bangladesh and it is because the economy of the nation is highly dependent on energy.

The summary above shows that even though energy consumption has risen over period, it is well below the rate needed for the nation to reach its growth goals. Natural gas is the principal energy source, and at the existing level of reserves, it cannot meet the anticipated future demand without fresh explorations being made. Coal, which is currently primarily imported, is the other important energy source. Domestic coal sources

should be investigated through the effort and expense for coal production in order to avoid the danger of price increases and lessen the load on the national treasury. Between 1998 and 2014 (14,611.2 kilogram tons of primary energy), the world's total energy consumption has doubled. As local energy sources were unable to keep up with demand, increased energy use resulted in larger energy imports. The average annual increase of energy imports from 1990 to 2009 was 17.35%. The amount of refined petroleum products imported in total in 2008 was 69.97 thousand barrels per day which was double the amount imported in 1998. In comparison to 1998, the total amount of coal imported in 2018 (881.85 thousand metric tons) was four times higher (205.03 thousand tonnes). The appendix's collected data shows Bangladesh's energy consumption and input of FDI.

This study has found that consumer price index of Bangladesh can affect the increase of FDI in energy sector as if CPI decreases in Bangladesh the demand of energy and power would increase among people and it would create the needs of more energy and power generation for the country and it could result in the needs of FDI in the sector as Bangladeshi government has lack of investments to generate energy and power elements. The energy consumption level is showing that it is increasing and growing every year due to higher population in Bangladesh and many buildings and industries are evolving which are increasing requirements of energy and power in the country. Therefore, this study was able to reach all its main objectives and questions by using its suitable research methods and it was able to implement correct data which helped to prove the main objective and purpose of the study.

According to the calculations, a 1% increase in consumer energy use tends to result in a 0.13 % increase in GDP. The research shows that there is a long-term relationship between electricity consumption and

economic growth, and that Bangladesh's energy crisis is a result of rising energy demand and a deficiency in power generation. In this study, the researcher looked at the relationship between electricity use and consumer price index for the period of 1996 to 2020. The paper finds single direction positive relationship causalities from consumer price index to FDI in Bangladesh as FDI can improve the consumer price index of people and a positive correlation from electricity consumption to FDI in the nation.

H1: There is a positive significant relationship between FDI and GDP growth in energy and power sector

By applying the 95% confidence interval on the multiple regressions to find relationship between dependent variable FDI and independent variable GDP, a positive relationship was found between those variables. OLS multiple regression models have showed relationship between foreign investments and GDP growth in energy and power sector of Bangladesh. This model showed that the significant value of p is 0.03 and the range accepts the hypothesis of the study that the result is particularly significant. Another regression model was also applied which is known as Newey-West regression model and the result of the model also proves the significant positive relationship between the dependent variable FDI and independent variable GDP as the p-value is 0.05. Therefore, both regression models showed that the result is positively significant and a positive significant relationship can be found between FDI and GDP.

Therefore, the hypothesis of H1 is accepted.

H2: There is a negative significant relationship between FDI and the increase level of energy consumption

The result of simple OLS multiple regressions showed that there a negative significant relationship between FDI and the increase level of energy consumption as the result was not significant. The study has

applied 95% confidence interval in the OLS multiple regression models, the p-value of energy consumption has been found at 0.00 which is less than 0.01 to 0.05. Therefore, according to the Fisher law, the result is negatively significant between variables when the result is less than 0.01 or more than 0.05. Another regression models was Newey-West regression method which also proves the testing that the variables are negatively significant as the p-value was 0.00. Therefore, both regression models showed that the result is negatively significant and a negative significant relationship can be found between dependent variable FDI and independent variable EC.

Therefore, the hypothesis of H2 is accepted.

H3: There is a positive significant relationship between FDI and consumer price index of Bangladeshi people

The result of OLS multiple regression showed that there is a positive meaningful relationship between FDI and consumer price index of Bangladeshi people. As the study has applied 95% of confidence interval in the variables, the simple OLS multiple regression results showed that there is a positive significant relationship between independent variable consumer price index and dependent variable FDI. The ols results have found that the p-value of the variable is 0.01 which indicated that the result is positively significant. Newey-West regression model was applied and it proved that there is a positive meaningful relationship between variables as the p-value has been found as 0.01. Therefore, both regression models showed that the result is positively significant and a positive significant relationship can be found between dependent variable FDI and independent variable CPI.

Therefore, the hypothesis of H3 is accepted.

6.3 The contribution of the study

The contribution of the study is that it has defined key determinants of the decision-making process in investment for power and energy sectors where the current situation of Bangladesh has been analysed using different studies and time series model. The result of the study can contribute private sectors of Bangladesh to understand how power and energy sectors are utilising investments and it could also help foreign investors to understand that power and energy sectors of Bangladesh are correctly utilising investments that they are getting. Readers can learn from the study that Bangladesh is getting potential GDP growth from the power and energy sector by collecting foreign and private investments (Khandakar, Amin and Khan, 2018). The positive relationship between energy consumption and FDI in energy sector has showed that Bangladesh needs lots of investments in energy sector as the requirement of energy among people are increasing and Bangladeshi government has lack of resources to produce energy and power.

ADF method and Philips Peron has contributed in the study by checking that all data used in the study has reliability and validity. Regression analysis has contributed in the study to prove the significance of each variable and hypothesis. Result of the study may show that the sector is depending on foreign investments where different factors such as social, economic, and political factors should be considered. The government regulation can affect the collection of foreign investments in the power and energy sector and the commitment of government with foreign investors should be precise and clear. Therefore, the study would contribute the government to understand how much foreign investments would be required in the sector and how the government should negotiate with foreign investors while collecting information.

6.4 Limitation of the study

As a result of these contradictory findings, it appears that there really is no clarity over how oil and gas in FDI influences economic expansion. The impact of foreign direct investment in Bangladesh's oil and gas industry on growth in the economy is investigated in this study. The study also identifies additional significant elements, using empirical reasons to describe the effect of foreign direct investment in the oil industry on Bangladesh's economic growth. Furthermore, Bangladesh's overreliance upon that oil and gas industry has remained an issue for the Bangladeshi government, highlighting the necessity for the country's economy to diversify.

The study aims to give insight on government laws to undertake in order to encourage bigger volumes of FDI and their anticipated implications for economic development and export performance by examining the motives for direct growth in Bangladesh and the level toward which FDI helps to growth. The growing importance of foreign direct investment (FDI) in overall economic growth through into the petroleum industry captivates interest in this study.

6.5 Future area of the study

This study has only evaluated three variables to analyse the relation between foreign direct investment in the energy and power sector Bangladesh which can lead economic growth of the nation. But more studies could be developed where many variables could be added such as tax exemptions, inflation rate, policies and imports of energy etc. But these variables were not used in the study because the researcher thinks that these variables would not show good results for the study and it could modify the result of the study. This study could be used by many researchers in the future who will want to explore the situation of FDI

in the energy sector of Bangladesh during the period of 1996 to 2020. In the future, researchers could add more years such as 2021 and 2022 by using these variables and they could show a different result in the future. In this research, the study has used OLS and ARCH model which has showed significant results of selected variables but it could show different results while using different equation and regression models in the future. Researchers can use the data of the study to explore relationship between variables by taking help from this result and they can explore some new findings.

6.6 Policy recommendations

To encourage both local private investment and foreign direct investment in the nation, the Government of Bangladesh has developed a number of measures. By mobilizing financial resources and fostering competition, these policies' main goals are to enhance the electricity sector and promote innovation. A variety of establishments and financial incentives are made available to foreign investors, including tax exemptions on royalties, technical cooperation fees, and infrastructure for their relocation; (i) tax exemptions on the interest on foreign borrowing; (ii) tax exemptions on capital gains from the transfer of property by the investing company. (iii) payment processing of up to 50% of earnings of foreign nationals hired in Bangladesh and infrastructures for resettlement of their long term savings advantages at the time of their exit; (iv) safeguards to prevent double taxation on foreign investors resulting from various international treaties; (v) deduction from taxable income for up to 3 years for foreign employees involved under the authorised sector; (vi) no restrictions on the issuing of employment given to pro-Bangladesh organizations; and (vii) mechanisms for the return of invested money, profits, and returns. Despite numerous regulations, Bangladesh's

development in the power and energy sectors has continued to be a major challenge for decades. Consecutive governments made promises to improve the energy and power industries, which were represented in national policy documents, but failed to follow through, which kept the power condition terrible. Energy security challenges in Bangladesh are diverse and can be categorized into five topics.

Chapter 7: Conclusion and Recommendations

7.1 Conclusion

Despite the fact that Bangladesh is lagging behind in terms of power and energy development, the industry has seen tremendous growth. In Bangladesh's Power & Energy industry, FDI is desperately needed. This research shows that FDI will assist Bangladesh in order to achieve energy stability. Simultaneously, this could aid the economic growth of the country. This article is limited since the energy industry will change continuously as a result of FDI but will have a long-term effect on the Country's economy. In the global market, the appeal to energy security and developing the power industry has gone large. Many developing nations are trying to reach a growth in energy sector by aligning the economic growth with an achievement of attracting foreign investments in respective countries. However, several conditions are given on developing countries such as Bangladesh when foreign countries are investing on the energy industry of those countries. Under developing and developing countries have found that technological factors and infrastructure limitations are major problems for converting renewable energy into energy sectors in those countries.

Power and energy supply must be constant in order for an industry to progress. In the case of Bangladesh, a growing nation that has had rapid economic expansion while also enduring a lengthy energy crisis, the significance of power becomes even more crucial. Bangladesh is a thriving expanding country in Asia with an increasing demand for power generation. Bangladesh aims to become a middle-income country by 2021 and a member of the 'highincome country' club by 2041 (Khandakar, Amin and Khan, 2018). The transition to a progressive country's

economy is heavily reliant on a steady power source and energy to meet industrial and home demand. The government of Bangladesh has acknowledged the need to accelerate power growth in order to meet the country's long – term economic growth goals.

This study has try to evaluate the potential of gross domestic product, consumer price index and energy consumption level where FDI can overcome limitations of the nation in the energy and power sector. The main focus of the study was to appreciate the association between economic growth of Bangladesh and FDI inflows in the specific sector. The result of the regression analysis in the fixed effects model found that GDP growth can influence and increase the FDI inflows in the sector where economic output of the country could be a great factor. Using Bangladesh as a research study, this research looked into the key factors of foreign countries investment decision-making processes when implementing FDI in the power industry (Karim et al., 2020). The findings suggest that economic variables are the most significant in determining whether or not to execute FDI in this industry, preceded by economic and financial factors. Future studies might focus on how additional FDI should be steered into this industry and the shifting characteristics of competition in the market that such a structure will reveal for commercial energy suppliers, as Bangladesh seeks to transition from such a single product to an extensive market economy as the market grows.

7.2 Recommendations

After conducting the time series data in the study, a result has been found and some recommendations are given based on findings of the study which can help Bangladesh to entice overseas investors to make investments in the power and energy sector of the nation.

Infrastructure investment, financial services, infrastructures, and public security and transparency are four main areas which need to be enhanced in order to attract long-term FDI in the electricity sector. Since obtaining land is a constant problem for overseas investors making investments in the power sector, and big areas of land at appropriate place near to the government's authority emergency facilities are difficult to come by, the government should consider establishing power stations at various locations which would provide the integrated infrastructure needed to build prospective energy plants.

- It is necessary to promote citizen safety and responsibility. This requires significant institutional reforms in the country's law enforcement in workplace of energy sector and attitudes in terms of making them directly accountable. As people working in the energy and power sector should utilise FDI in the right manner (Ahmed and Tanin, 2020). In this sense, more society enforcement, particularly community enforcement, is needed to ensure that protection operators in emergency situations are competent, responsible, and respectful of individual rights.
- A truly competitive decision procedure is required for procurement, ensuring an appropriate assessment criterion that matches the optimum operational and economical responsiveness of projects while avoiding vested group interests. In this context, the government should stop cultivating inappropriate proposals, which raise questions about the purchasing process's openness, transparency, and integrity (Power Division, 2020). Furthermore, in order to attract large amount of foreign investments, it is necessary to assess the attractiveness of the market of developments early on, establish a baseline potential levels of interest from severe buyers and funding agencies, and devise

appropriate profit sharing agreements in the initial stages of the project in event of abnormal uncertainties such as a primary fuel shortage of supply.

- As energy consumption has a negative relationship with foreign investments due to the high cost of energy and the requirements of energy consumption level in the country, the government should work on lowering the cost of energy and power. To increase the level of energy consumption used by Bangladeshi people, the country will require lots of foreign investments from foreign countries such as India, Russia, the UK, the US, China and Japan (Hasan et al., 2022). For example, Chevron is a famous multinational energy corporation of the USA which invests in the gas and energy sector of Bangladesh after looking at the energy consumption level and GDP growth of the country.
- As the analysis showed that Bangladeshi government could use the positive relationship between FDI and GDP growth and consumer price index, the country should hold the good position in these two economic variables and it should continue to grow its GDP growth to attract more countries to invest in the energy and power sector of the nation. It is estimated that maximum foreign investors are looking at GDP growth of a nation while investing in a country (Wiig and Kolstad, 2014).

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Appendix 1) Data collection

Foreign investments in energy and power sector from 1996-2020:

Year	FDI in energy and power sector (In Billion US dollars)	Year	FDI in energy and power sector (In Billion US dollars)
1996	66.82	2009	292.22
1997	79.04	2010	296.90
1998	81.88	2011	304.57
1999	83.51	2012	357.71
2000	124.45	2013	479.04
2001	126.22	2014	494.50
2002	127.91	2015	408.41
2003	229.30	2016	417.55
2004	230.18	2017	422.67
2005	233.38	2018	414.95
2006	245.19	2019	466.51
2007	257.35	2020	446.81
2008	280.31		

GDP Growth in Bangladesh from energy and power sector:

Year	GDP growth (In Billion US dollars)	Year	GDP Growth (In Billion US dollars)
1996	2.66	2009	51.22
1997	8.76	2010	54.58
1998	13.87	2011	63.92
1999	11.56	2012	72.5
2000	17.09	2013	76.88
2001	11.34	2014	70.98
2002	19.65	2015	60.22
2003	22.55	2016	64.44
2004	28.72	2017	65.05
2005	28.34	2018	97.88
2006	37.44	2019	104.95
2007	35.02	2020	133.77
2008	47.61		

Level of energy consumption in energy and power sector:

Year	Level of energy consumption in energy and power sector (In KWH)	Year	Level of energy consumption in energy and power sector (In KWH)
1996	8.98	2009	14.02
1997	10.22	2010	16.01
1998	12.08	2011	18.27
1999	11.51	2012	20.51
2000	13.66	2013	21.77
2001	14.07	2014	23.56
2002	15.22	2015	25.90
2003	16.90	2016	26.11
2004	17.22	2017	25.71
2005	16.91	2018	24.88
2006	18.23	2019	26.98
2007	16.41	2020	26.61
2008	15.22		

Consumer price index in energy and power sector:

Year	Consumer price index (In growth percentage)	Year	Consumer price index (In growth percentage)
1996	1.3	2009	5.4
1997	1.7	2010	8.1
1998	1.9	2011	11.4
1999	1.8	2012	6.2
2000	2.2	2013	7.5
2001	2.0	2014	7.0
2002	2.5	2015	6.2
2003	3.0	2016	5.5
2004	7.6	2017	5.7
2005	7.0	2018	5.5
2006	6.8	2019	5.6
2007	9.1	2020	5.7
2008	8.9		

국 문 초 록

- 경제 성장을 위한 방글라데시의 전력 및 에너지 부문에 대한 외국인 직접 투자 -

한 성 대 학 교 대 학 원
국 제 무 역 경 제 학 과
국 제 무 역 시 장 전 공
하 산 메 히 디

본 연구는 연구와 관련된 주요 문제점을 찾고자 하였으며 연구의 배경을 논의하였다. 서론에서는 본 연구의 주요 문제점을 파악하여 연구의 목적과 목적을 제시하고, 연구 전반에 걸쳐 답을 얻을 수 있는 연구 질문을 개발하였다.

문헌 검토 장에서는 방법론 장에서 논의될 주요 변수를 찾기 위해 연구하는 데 도움이 되는 몇 가지 주요 문헌 출처를 찾았으며 연구는 또한 일부 특정 데이터가 있어야 하는 이러한 유형의 연구에 어떤 방법론이 가장 적합한지 찾는 데 도움이 되었습니다. 매년 복용합니다. 방법론 장은 연구에 완벽할 수 있는 방법론을 수립했으며, 본 연구는 다음 연구의 발전에 도움이 될 것이며, 연구의 의의를 입증하는 데이터 분석 챕터를 구축하는 데 도움이 될 것입니다.

데이터 분석은 긍정적인 결과를 확인하기 위해 노력한 연구의 의의를 보여주기 위해 연구의 선택된 가설을 증명하기 위해 노력했습니다. 연구 종료 후 결론과 제언을 하여 미래의 연구자들이 주제를 연구하면서 방향을 잡을 수 있도록 하였다.

[키워드] 생산, 식별, 개발, 전체, 방법론, 확립, 완벽, 분석, 중요성 및 권장 사항.