**The Effects of Exchange Rate Policy on the Macroeconomic Performances of Myanmar:
Especially on GDP and International Trade**

A Dissertation

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by

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Contents

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Introduction

1. Backgrounds and Overview of the Study

The exchange rate is one of the essential tools in macroeconomic policy. Many economists regard the exchange rate as a type of monetary policy because the exchange rate can influence the country's economy in both aggregate demand and supply channels through investment and trade and cost of production, respectively. When discussing the exchange rate policy has two points: choosing the exchange rate regime and determining the rate at foreign exchange transactions. The choice of exchange rate regime and its impact on economic performance is still a controversial topic in macroeconomic policy. Even though much previous literature explored the link between these two policy variables, no literature can provide unambiguous implications of this relationship yet. It is still under the topic of the arguing nexus of exchange rate and economic growth.

A fixed exchange rate regime, with a lack of exchange rate adjustments, results in distortions and misallocation of resources in the event of real shocks and induces higher output volatility. On the other hand, this fixed exchange rate regime with low uncertainty stimulates investment and trade and thus increases growth. Moreover, under fixed exchange rate regimes, the monetary policy discipline assumes predictability and reduces a country's vulnerability to speculative exchange rate fluctuations, which are conducive to promoting more robust growth performance. However, some previous studies found that for developing countries, less flexible exchange rate regimes are associated with slower growth, and industrial countries have no significant growth.

In Myanmar, in 1977, the fixed exchange rate regime was adopted. The official rate, pegged with 1SDR=8.5 Kyats, was only applied to the public sector for fiscal accounting of such administrative allocation of foreign exchange and can't be applied in the private sector's transaction. This fixed official value is inconsistence with reality and creates many economic distortions. This overvalued official exchange rate undermined economic activity involving all tradable goods of the countries. The persistence of this situation suffered the country's industrial base to shrink, discouraged the investors, encouraged the migration of the workers because of the lack of job creation in the country, wider the poverty gap between the rich and poor, and forced to deepen the poverty. Furthermore, the inconsistency of the currency exchange rate system of the country is also born to illicit economic activities, such as the black currency market and other

related problems. Therefore, Myanmar needs to address the problem of the overvalued official exchange rate and the growing illegal black market of the exchange rate; otherwise, the substantial economic damage will be unavoidable in the longer run. To overcome the problematic exchange rate policy, which distorted Myanmar's economic activities, the authority changed the fixed exchange rate system to manage to float and unify the currency exchange between the official and market rate.

2. Objectives and Contribution of the Study

The purpose of this research is to address the effect of exchange rate policy and system uncertainty on the macroeconomic performance of Myanmar. To explore the main purpose, some crucial requestions are identified in this study. How does the exchange rate impact on trade balance of Myanmar? How does exchange rate policy change influence growth? How does exchange rate volatility impact the trade flows between trading partners? And then, how does economic policy uncertainty of external factors influence Myanmar's exchange rate and country's economy?

To analyze the exchange change rate impact on the country's trade balance, the Switching Regression Model was used to estimate the change in the currency regime between appreciation and depreciation and how it impacts and reacts to the country's trade balance. There are vector autoregressive (VAR) model and vector error correction model (VECM) applied to explore the effect of exchange rate policy reforms on the economic growth of the country and the long-run and short-run relationship of macro indicators in the systems model. Furthermore, the gravity model with panel data analysis technique was employed to find out the relationship between the exchange rate and trade flows of Myanmar with major trading partners. Moreover, this study evaluates the shock of global and major trading partners' economic policy uncertainty impact on Myanmar's economic performances and activities and employed the Vector Auto Regressive (VAR) approach to inspect the impact of economic policy uncertainty on Myanmar's economy by global EPU and major trading partners' EPU. The major trading partners in this study include China, Japan, United States, India, South Korea, Singapore, and Hong Kong according to their larger value of trade with Myanmar.

The main finding of the research shows that in the long run, the real exchange rate has a positive impact while inflation debilitates the real GDP growth rate of Myanmar. However, the real exchange rate has no short-term dynamic impact on the real GDP growth of Myanmar. In

addition, the 2011 CBM policy reform of the exchange rate significantly impacts the country's growth rate. Therefore, the policy reforms provide a positive effect in leading to sustainable growth with price stability. Moreover, the liberalization and unification of the exchange rate policy reforms were gainful to Myanmar's economy as they promoted the steady growth of the economy. In addition, the global economic policy has a significant impact on the nation's industrial production, trade sector, and unemployment. The shock of global economic policy negatively impacts these three sectors compared to the other economic variables. Moreover, among the major trading partners, the economic policy uncertainty of China and Hong Kong has a more influential impact on Myanmar's economy, especially on the industrial and trade sectors. The shock of China's economic policy uncertainty has fluctuated impact on industrial production and trade by time variance and has slightly shocked the country's unemployment.

The main contribution of this study is evaluation the exchange rate policy in Myanmar through different government eras and explore the system and regime of exchange rate policy in Myanmar in the historical period and examine and find out the effect of exchange rate policy risk on the economy and how policy reforms influence the economic growth of the countries. The second contribution is analyzed the effect of policy reforms impact on growth and the result explored after significant political transformation and economic reforms, including crucially exchange rate and trade policy reforms, there were significant effects on foreign trade issues by positive effect on the trade flow between Myanmar and its trading partner countries. On the other hand, the volatility of exchange rate risk has a negative impact on the economy. Therefore, it can extend the idea of policy maker in conducting the policy of sustainable growth, the consideration of exchange rate policy has one of the crucial roles on the economy. In the third contribution, this study has also contributed the existing literature on addition points of view of the external economies' policy uncertainty impact on the own economy. Because there are less previous studies of other country's economic policy uncertainty impact to home country and most of the study explored how own country's economic policy uncertainty impact own countries' economic growth. The analysis results shown, the small open and developing economy, like Myanmar, have been significant impact by economic policy uncertainty of the world and the countries that have strongly political and economic relation with Myanmar.

3. Structure and Organization of the Study

The organization of research proceeds as follows. Section 1 depicted the evolution of the economic growth under the different government eras during the study period. Section 2 explored the effect of exchange rate policy reforms on growth and Section 3 analyzed the impact of the switching regime of exchange rates on the trade balance of the country. In addition, section 4 explored the relationship between exchange rate and trade flows of Myanmar and her Major Trading Partners by applying Gravity Model Approach. Section 5 is analyzed the impact of global and major trading partners' economic policy uncertainty on exchange rate and macroeconomic performances of Myanmar. Finally, the conclusion and possible interpretations are discussed in the conclusion and policy recommendation section.

Overall Framework and RoadMap of the Dissertation

Effect of Exchange Rate Policy on Macroeconomic Performances of Myanmar

1. *Ex-rate policy contributed to explain the Myanmar Economy*
2. *Policy Reforms have positive effects on Growth*
3. *ex-uncertainty has negative impact on trade flows*
4. *Currency depreciation obscure to explain trade balance*
5. *External EPU influenced more on economic growth than only on exchange rate*
6. *comprehensive ex-rate policy reforms is one of the crucial factors to contribute in substantial growth of Myanmar*

Overview of Myanmar Economy

Exchange Rate *Reforms and Growth*

Exchange Rate and *Trade Balance*

Exchange Rate and *Trade Flow*

- ➢ Analyze long-run relationship and short-run dynamic of the ex-rate and Growth
- ➢ Co-Integrated VAR
- ➢ Long-Run positive Impact and inconspicuous in Short-Run

- ➢ change in ex-rate and impacts on TB
- ➢ Switching Regression Analysis
- ➢ inconsistence ex-rate policy significantly worse TB

- ➢ ex-rate policy reforms and trade flows
- ➢ Gravity Model Approach
- ➢ ex-rate uncertainty negatively impacts on Trade flow
- ➢ policy reforms can advantage the economy

GEPU & MEPU on Myanmar's Economy and Exchange Rate

- ➢ Evaluate GEPU & MEPU effect on economy and ex-rate
- ➢ VAR
- ➢ Global economic policy has a significant impact on the nation's industrial production, trade sector, and unemployment

Notes: ex-rate = exchange rate
GEPU = Global Economic
Policy Uncertainty
MEPU = Major's Trading Partners
Economic Policy Uncertainty
TB   = Trade Balance

Chapter I

Economic Growth of Myanmar: Under the Distinct Government Era

1. Overview of the Myanmar Economy

Myanmar is one of the largest country in mainland of Southeast Asia with 54.81 millions of population estimated in 2021 by world bank organization. Its border with emerging and rising power countries in the region_ China and India and other border countries are Thailand, Laos and Bangladesh. Myanmar is located at the strategic geographical location because it located in the significant back doorstep of the China into the Indo-Pacific region and also has 2800 km of Coastline that lead to the Malacca Strait and it sit on the western opening of the India Ocean, therefore, it becoming as a commercial corridor for both emerging neighbors. Myanmar was basically an agricultural country with over 40 percent of Gross Domestic Product (GDP) before one to two decades and reducing about 20 percent of GDP in the estimated of 2019 in Central Statistical Organization of Myanmar. The contribution of services sectors_ transportation, communications, financial institutions, trade, etc_ increases to 40.69 percent of GDP in 2019.

The economy of Myanmar was extremely suffered after World War II and estimated that approximately half of Myanmar's national capital was destroyed during the war.[1] Myanmar was gained independence from British on 4 January 1948 and face domestic political instability in many decades. After post-war Myanmar's economy can be divided into six potions of political economy as follows: the period of parliamentary democracy with a mixed but free economic system（1948-1962）; the period of command and socialist economy under military rule（1962-1988）; the period of market-oriented economy under military rule（1988- 2010）; the period of economic liberalization under military transform of initial new civilian government (2010-1015); the period of new democratic government (2015-2020); and the period of military coup of 2021 (2021- to date).

Myanmar economy was relatively stable during the first period but began to deteriorate since the second period at an accelerating pace that once the most developed country in Southeast

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[1] Myat Thein, Economic Development of Myanmar. 2004

Asian region until early 1960s was degraded to the status of Least Developed Country in 1987. The dissatisfaction of people heightened in 1988 and broke out into general uprising, which eventually led to a change of government in that year in a coup-de-tat by the 'State Law and Order Restoration Council', which later changed its name to the 'State Peace and Development Council'. The SLORC/SPDC initiated some liberal reforms1 and made considerable investment to build the physical infrastructures, which paid off as reflected in the successful implementation of the First Four-Year Short-Term Plan from 1993 to 1996. However, the reform was partial and short lived, and the economy suffered later from the legacy of central planning and macroeconomic imbalances. Many flaws and deficiencies were noted in both formulation and implementation of policies and plans so that the economic performance was very poor, and the economy was plagued by high inflation and macroeconomic instabilities with all characteristic features of underdevelopment.[2]

In 2010, under the general election the transform by military to new democratic government reforms many sectors in country. Myanmar did the election once in five year and in 2015 the NLD win the election and under the lead by Daw Aung San Suu Kyi. In the election of November 2020 NLD win the election again and military took the power again and the country economy slump to the fail state during over a year under the 2021 military coup.

2. **Macroeconomic Performance of Myanmar**

The macroeconomic performance of Myanmar under different government era is briefly analyzed by comparing selected macroeconomic indicators that crucial and attention for Myanmar economy in different economic era. To picture out the economic performance of Myanmar, in this study analyzed eight major economic indicators: Real Gross Domestic Product (GDP), GDP Growth Rate, GDP per capita, Inflation, Exchange Rate, Trade, Foreign Investment and Structural change of the economy.

2.1 Growth and Inflation Under different Government Era

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[2] Tin Soe, Policy Dilemmas and Economic Development: A Case Study of Myanmar of Myanmar in Transition, 2008

The macroeconomic indicators are important to brief understand the situation of the economy. In Myanmar, military group took power for a long time and citizen of Myanmar has less opportunities to enjoy the democracy. The GDP growth rate between the different government can be seen in Table 1. The tick line in the table is divided to understand the different government period. Under the period of market-oriented economy by military rule, the economic growth rate was about two-digit 12.42 percent and 13.57 percent in 2000 and 2005 respectively. However, most scholars have mistrust with Myanmar's official data of GDP growth rates at that time, other reliable organizations such as Economic and Social Commission for the Asia and Pacific (ESCAP) and International Monetary Fund (IMF) was estimated Myanmar economic growth by between 3 to 5 percent.[3]

In November 2010, Myanmar's political economy started to transform and held its first election in more than 20 years. From this election, the new civilian government emerged and headed by President Thein Sein began as an extension of military rule with a little prospect for democratization and economic reforms in many sectors in the economy. The average GDP growth was about 6.6 percent in the five-year period of this new civilian government era from 2011 to 2015. In that government era, series of political, economic and administrative reforms was revealed, and the notable reforms are attracting Foreign Direct Investment (FDI), trade liberalization, enhancing regional economic cooperation and replacement of the overvalued fixed exchange rate with a managed float, etc.

In the general election of 2015, the National League of Femocracy (NLD) won 80 percent of majority of the vote and the democratic government that was the majority of citizen of Myanmar advocated government by leading the State Counsellor Daw Aung San Suu Kyi. The primary objectives of economic policy under the new democratic period was to achieve inclusive and continuous development and to establish an economic framework that supports national reconciliation based on the just balancing of sustainable natural resource mobilization and allocation across the States and Regions.[4] To achieve that objectives, the government set the

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[3] Tin Soe, Policy Dilemmas and Economic Development: A Case Study of Myanmar of Myanmar in Transition, 2008
[4] Myanmar has seven States and Regions. Detail in following link
https://en.wikipedia.org/wiki/Administrative_divisions_of_Myanmar

twelve points statement of policies.[5]The most significant economic reform in that government era was replace a consolidated the Myanmar Investment Law 2016 for previous Foreign Investment Law 2012 and the Myanmar Citizens Investment Law 2013. The average growth rate in democratic government era was 5.8 percent and that lower than the average growth rate of previous government era. Because in that government era the Cyclone Komen in 2015 and the growth rate was lower to 3.2 percent. Unfortunately, the global pandemic also hurt the same government period in 2019 and it also suffer the home country economy and the economy of the rest of the world.

Figure 1. Real GDP Growth Rate and Inflation Rate Under Different Government Era
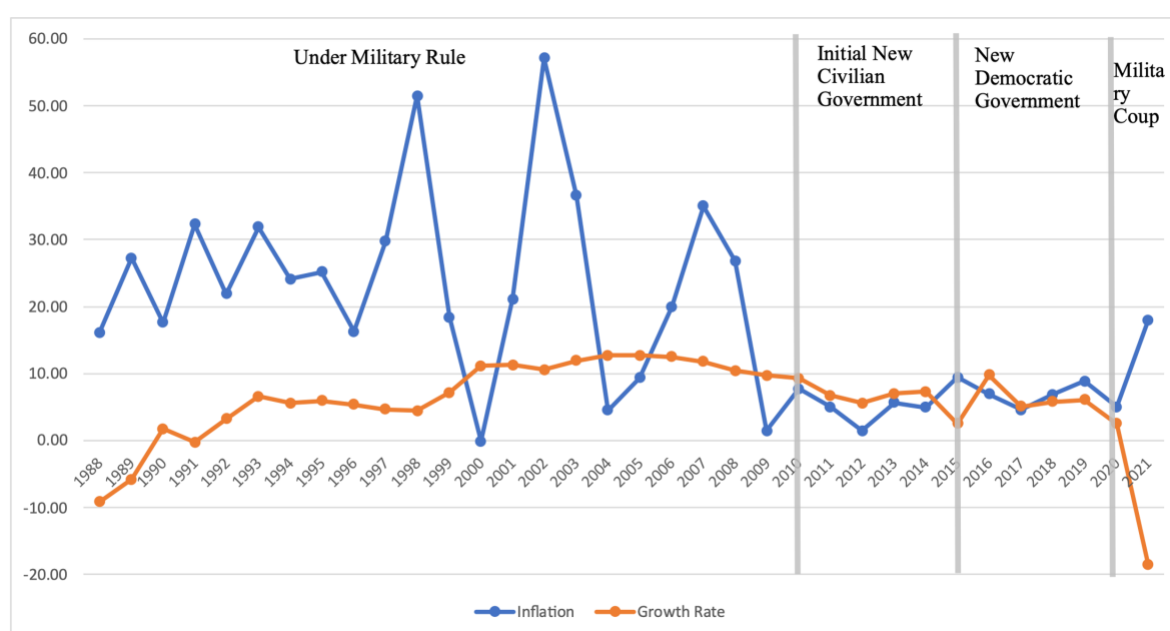
Source: World Bank Data[6]

Myanmar citizen only have a chance to taste the freedom of democracy for a few years and in February 2021 the State Administration Council that established by Senior General Min Aung Hlaing was took the power sign a confession under duress against the result of election 8th November 2020. Under this military coup not only because of Covid-19 but also political problem, the economic growth of Myanmar declined over 18 percent in 2021. This terrible declined in economic growth with two digit is worst over three decades. The growth rate had been declined to

7 percent in 1988 which was also the time of coup d'état. The comparison of real economic growth and per capita GDP growth of Myanmar during the different government era is shown in Appendix 1.

On the other hand, inflation is also become one of the intimidation problems for the citizen of Myanmar with two-digit 17.3 percent of inflation in March 2022.[7] The food price and non-food price increase 15.4 and 20.4 percent respectively. The reasons of this sharply increase in price was relate to combined effect of global price increases due to the Ukraine war and the depreciation of Myanmar Kyats (MMK) due to inconsistence policy change from the central bank of Myanmar under the military coup. Therefore, the domestic fuel price with 70 percent in December 2021 and that push up the production cost, transportation costs and it hit suffer the production of the economy.

Figure 2 Comparing Per Capita GDP of CLMV countries under Different Government Era
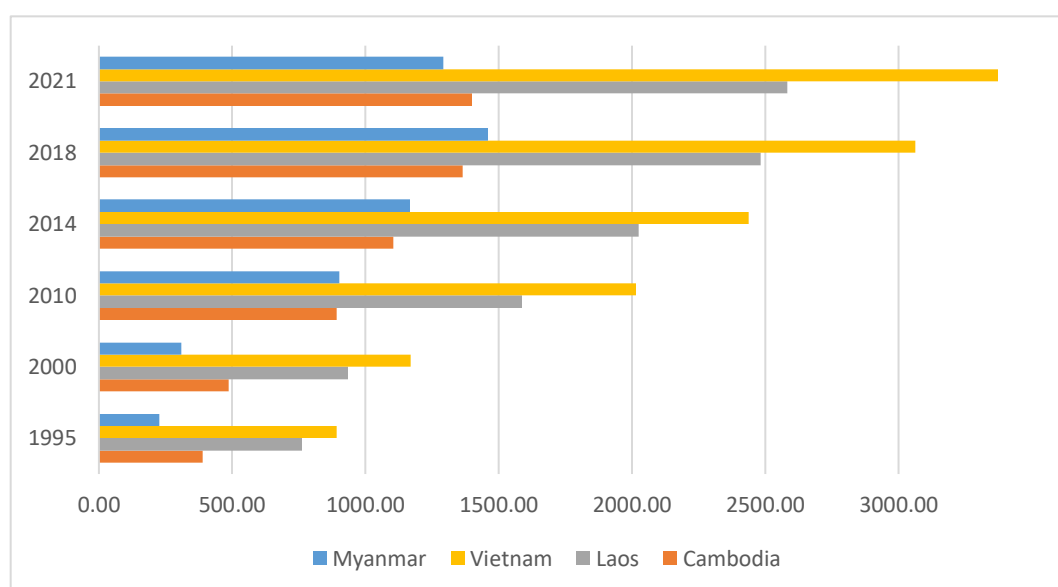
Source: World Bank Data[8]

The historical real GDP growth rates for Myanmar during by decades for the period of 60 years 1962 to 2022 illustrated that there are two times sharply decline in growth rate first time in

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[7] Myanmar Econoimc Monitor July 2022
[8] https://data.worldbank.org/indicator/NY.GDP.PCAP.CD

1988 and second time in 2021. Both of that time was due to military coup and the second time in 2021 is worse than previous coup because of combining effect of world pandemic of Covid-19 effect. The growth rate after 1988, in the period of Military rule in the years of 1990s and 2000s, was unusual with the double digit in the rate of over 10 to 12 percent.[9] The continuous real GDP growth rates with this tow digit was impossible unless a favorable economic environment persisted in the economy, however, most of scholar doubt on Myanmar's economic policy environment and point out the unfavorable condition during that decade.

Figure 3. Growth Rate of Per Capita GDP in CLMV Countries in Different Government Era
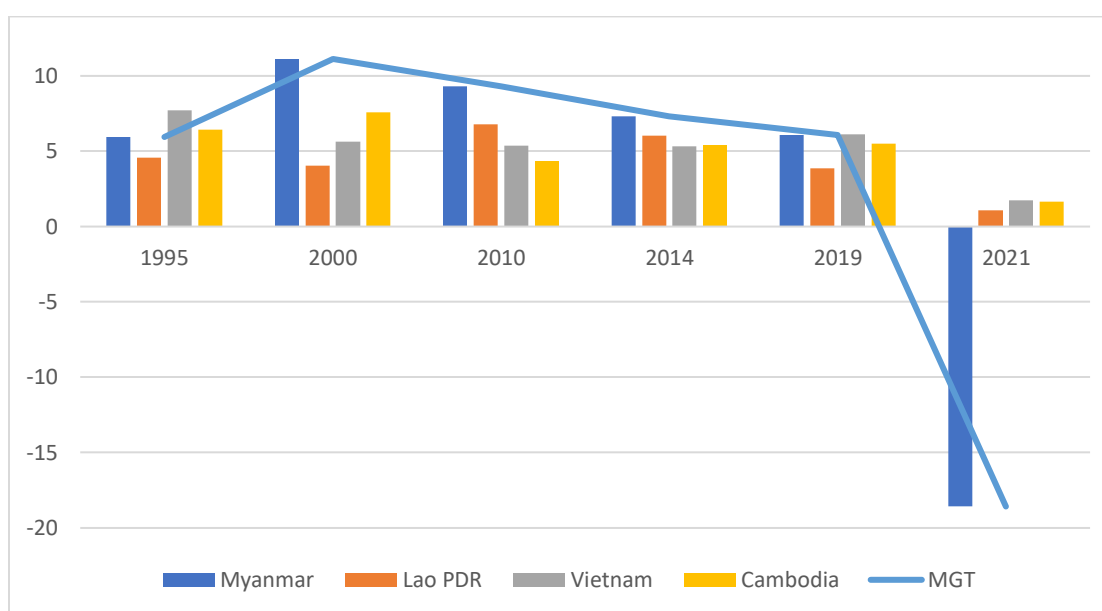
Source: World Bank Data[10]

Notes: MGT= Myanmar's Growth Rate

The CLMV countries _Cambodia, Lao, Myanmar and Vietnam_ are the newest and lowest per capita income in the Association of Southeast Asian Nations (ASEAN). Among than Myanmar was lowest per capita income with 226.08 US $ in 1995. In figure 2 illustrate that, in different four

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[9] See Figure 1 in Chapter 1 and Figure 3 in Chapter 2.
[10] https://data.worldbank.org/indicator/NY.GDP.PCAP.KD.ZG

government era the per capita income was significantly lowest among lowest income group in CLMV especially under Military Rule 1990s and 2000s. The per capita GDP became to second lowest with 1167.63 US$ in 2014 and 1459.64 US$ in 2018 that are under New Initial Civilian government and New Democratic government respectively. In these government eras, the governments were actively did the economic and political reforms in various sectors. Again, unfortunately Myanmar was detention under Military coup again in 2021 and the per capita income level reached to the lowest with 1292.09 US$ and per capita GDP growth was extremely tumble to -18.58 after the military coup it can be seen in Figure 2 and 3.

2.2 Exchange Rate Under Different Government Era

Myanmar economy suffer by inconsistent exchange rate policy and various parallel exchange rate for several years. Under the government era of Military Rule, the authority organization applied the fixed exchange rate system and official exchange rate that fixed at 6 MMK per US dollar. That rate remained intact several years under military rule period and that was out of alignment with the regional and international trends in costs and prices.

Figure 4. Exchange Rate Under Different Government Era
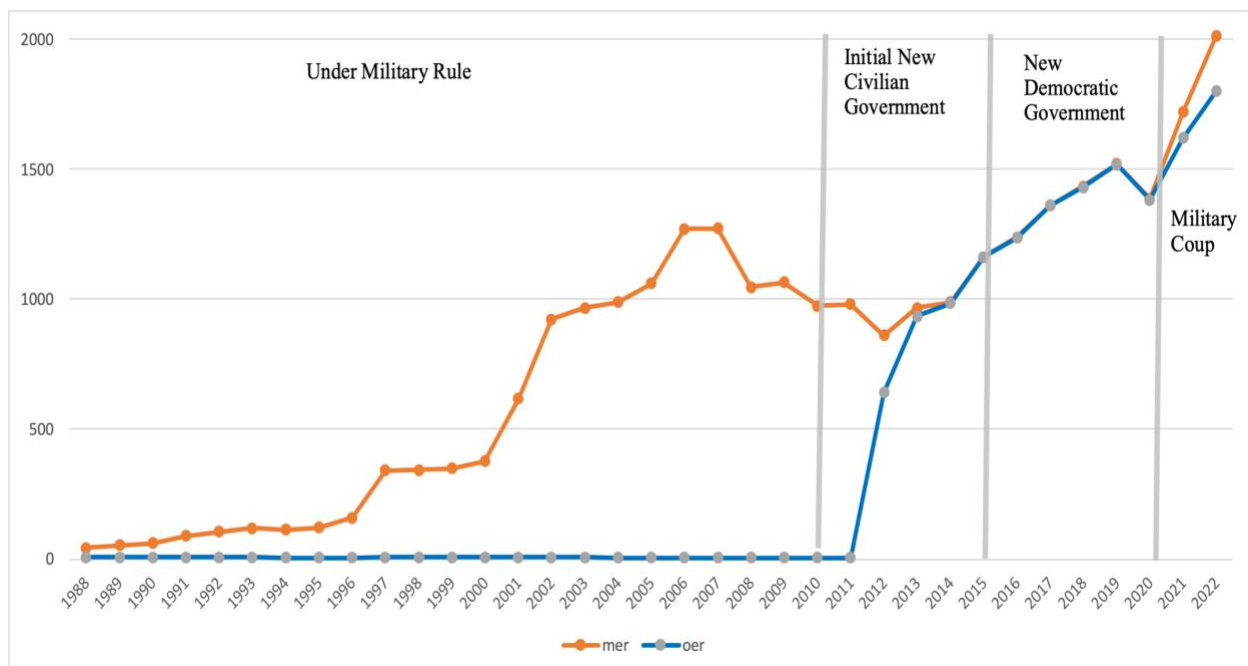
Source: Central Bank of Myanmar, Various Foreign Exchange Brokers at Shwe Bon Thar Street Yangon

Therefore, this rate couldn't activate in the real-world private sectors transaction, and it applied in the official government's sectors transactions only. In consequences, the economy harmful under that era because of extremely exchange rate gap between official rate and black-market parallel exchange rate with over 200 times in 2007(see data in Appendix 2).

This parallel exchange rate problems could reduce in 2012 under the elected government of New Initial Civilian Government' reforms of exchange rate policy to manage float exchange rate system by unifying these two fixed official rate and black market rate by abolishing the official rate in the way of increased the supply of MMK relative to dollar in the economy and Central Bank of Myanmar(CBM) released the reference rate and permitted private exchange rate centers and removed restrictions on buying and selling of foreign exchange. In that government era, the enormous gap between official and parallel black-market rate reduce to nearly zero after 2012.

However, after Military coup the parallel exchange rate and illegal black exchange market problems rebirth again with huge depreciation of MMK and wide gap between over value official and market exchange rate. The CBM set the reference with 1850MMK per US$ and in April 2021 and increase this fixed rate to 2100 MMK that different nearly 30 percent with black market rate in August 2022. The depreciation of exchange rate attributable in part to lower FDI inflows, chaos in international trade. The economy faces the problem of depreciation, inflation and growth rate decline and some scholars denoted Myanmar economy fallen to fail state under Military coup of 2021.

2.3 Trade Sector Under Different Government Era

In Myanmar before 1988, the external sector does not appear to be very important as external trade with the contribution of 2 to 3 percent of GDP according to the official statistics of the own country. However, this situation might be understating the real situation because of valuation via the distorted exchange rate and also significant amount of unrecorded trade across the border.[11]

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[11]Myat Thein, Economic Development of Myanmar, 2004, pg-154

Figure 5. Contribution of External Sector in GDP (% of GDP)
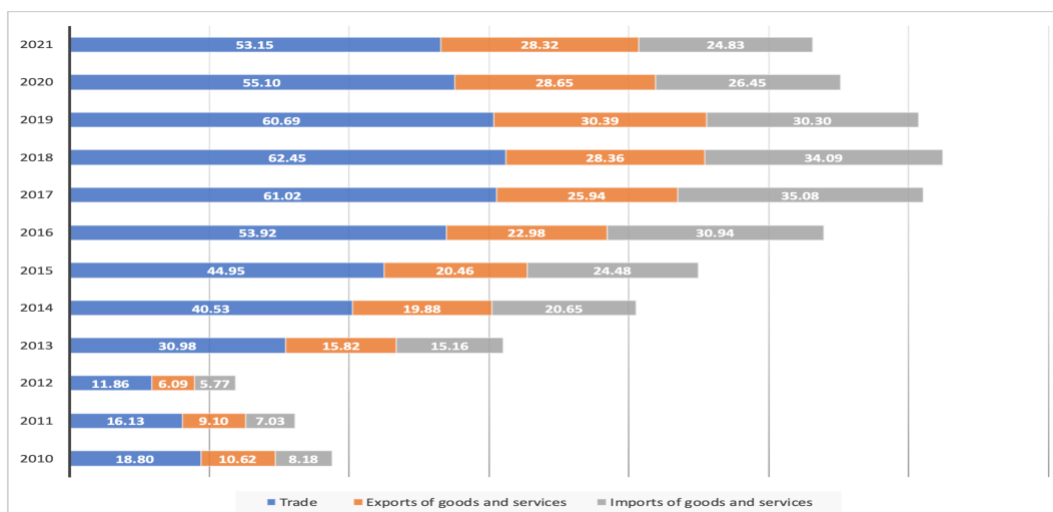
Source: Myanmar Statistical Year Books, World Bank data

The trade sector increases gradually accordance with the market- oriented policy under the military rule liberalize some restrictions on trade to promote private sector participation in foreign trade, therefore, the trade sector grew rapidly during 1990s decades and earlier 2000s. But the contribution to GDP was only 18.8 % of GDP in 2010 that is the end of the government era of military rule.

Under the new initial civilian government, aimed the economy to get comprehensive economic development by initiating series of economic reforms including liberalization of trade and foreign investment as an integral part of the reforms. As a result of these trade liberalization the contribution of trade in GDP became 40.53 % in 2014. These contributions continuously increased and reached 62.45 % in 2018 under the new democratic government. Therefore, the external sector became the crucial potion as enormous contribution of trade sector in country economy. The contribution decline again in 2019 and later because of the risk of own country political crisis and global risk of Covid-19 pandemic, global inflation due to Russia-Ukraine War.

Figure 6. Export, Import and Trade Surplus and Deficit as a Percent of Import
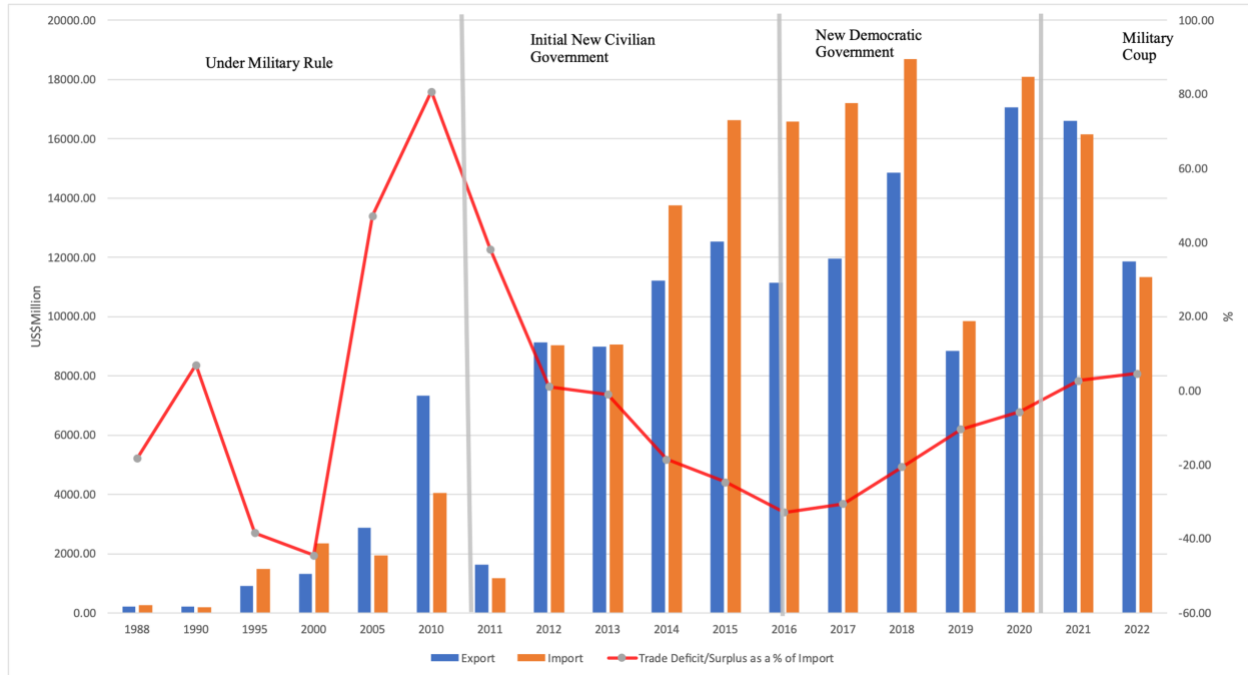
Source: Myanmar Statistical Year Books, World Bank data

Myanmar was the primary products exporter and huge importer of capital and intermediate goods at the unfavorable terms of trade. The primary products of agricultural was over 45 % of total export in 1996 and transformed and change to natural gas exporter in 2000s with 40 % of total export and the contribution of agricultural decline to 12.23 %. In the different government era, the primary product exporting is highest under military ear and the second and third highest exporting commodities are timber and marine products. In 2022 under the military coup the percentage of manufacture sector increase over 50 % of the total export. Import composition was not very different among all government eras. The share of importing intermediate goods is wider and narrow in the share of capital goods in 2022.

Figure 7. Export Composition by Commodities in Different Government Era (% of Total Export)
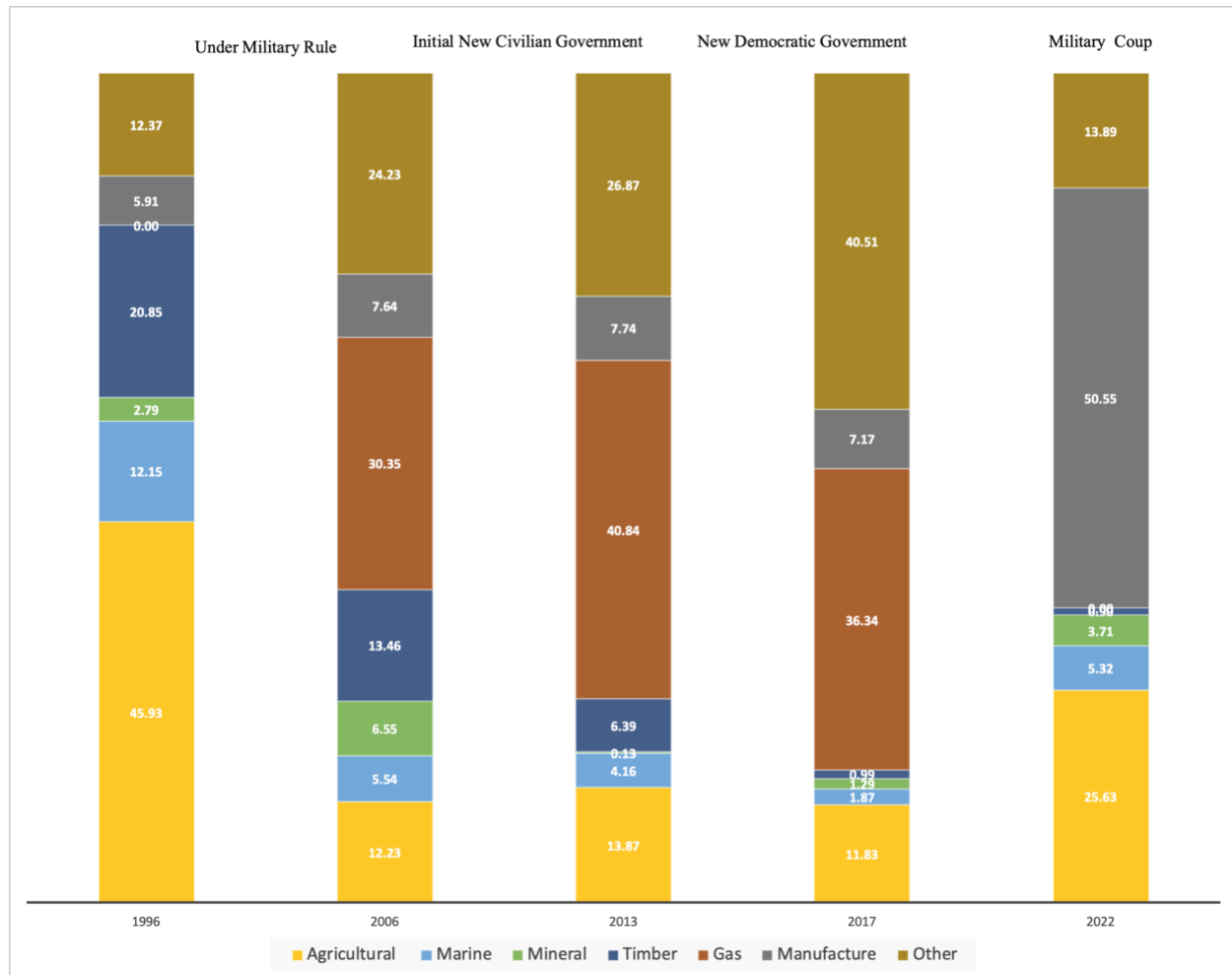
Source: Myanmar Statistical Year Books

However, in summarizing, Myanmar have to import capital goods and even consumer goods in large scale of total import. On the other hand, Myanmar can only export agriculture, timber and natural gas that is unrenewable natural resources with the negative balance of trade about a decade.

Figure 8. Import Composition by Commodities in Different Government Era (% of Total Import)
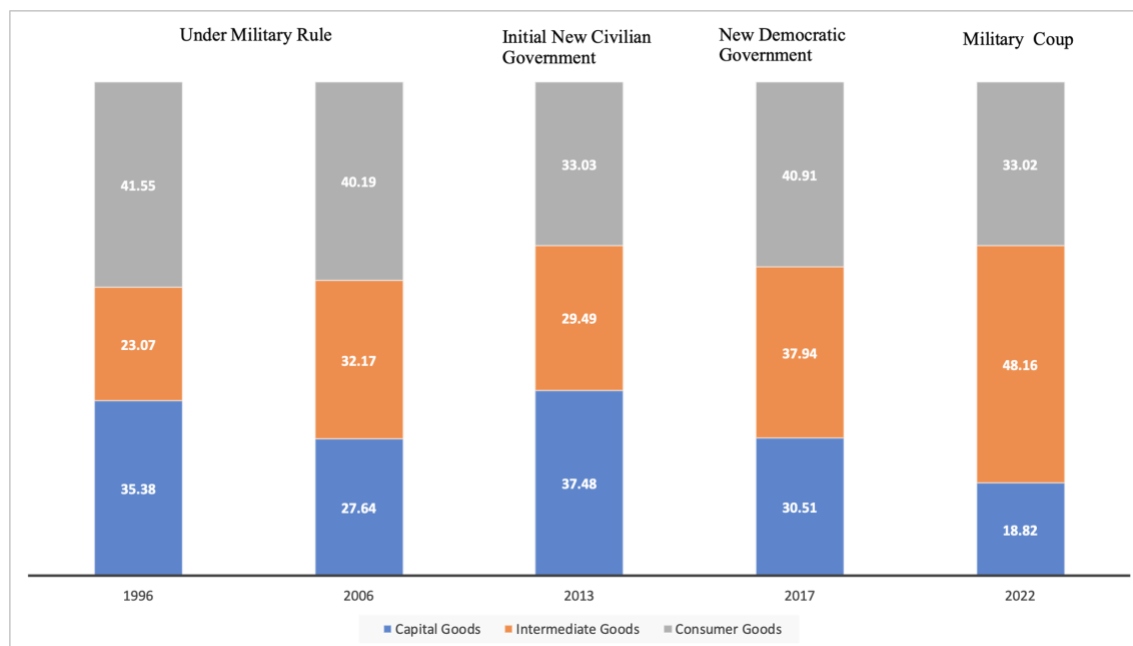
Source: Myanmar Statistical Year Books

2.4 FDI Under Different Government Era

In Myanmar, in the years of 1980s, there was very few FDI because of lack attractive investment climate, rigidity import and export regulations, a weak judicial system, meaningless currency controls and weak property rights. Under the Military Rule, in 1990s the liberal Myanmar Foreign Investment Law was introduced with several attractive incentives to potential foreign investors including exemption from income tax for extending to three consecutive years, relief from customs duty or other internal taxes or both, etc. Therefore, FDI started coming into the country from 1990 but even before the mid 1990s the volume of FDI inflow was not significant large. When divided two segments under military rule in the years of 1990s and 2000s, the structure of FDI inflow was discrete, it can be seen in figure 9. The total among of FDI was sharply decline in 1990s because of the lack of a sound investment environment was a major factor inhibiting inflow of FDI. Among the factors inhibiting inflow of FDI were the existence of dual exchange rates, lack of infrastructure such as poor electric power condition, poor telecommunication services and expensive charges, unstable macroeconomic environment, frequent changes of rules and regulations and lack of transparency in its administration. These factors created the greater loss of

investor interest in Myanmar with new restrictions imposed in 1998 on trade. The Asian economic crisis in July 1997, was also one factors to dramatically decline the FDI inflows to Myanmar.

Figure 9. FDI by Sectors Under Military Rule
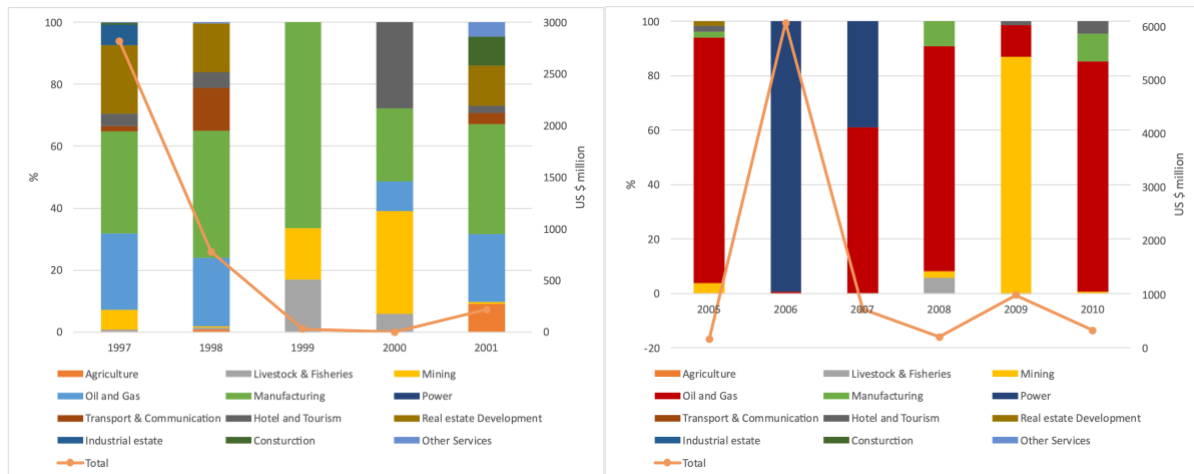
Source: Myanmar Statistical Year Books

Under the Military rule, FDI in Myanmar changes over time both trend of investment and in the source and sector of investment. In that military era the FDI inflow heavily concentrated in the extractive and power sectors, while almost extremely lower investment in risk-sensitive industries investment in manufacturing, services, and other secondary and tertiary sectors. This drop was the result of the poor business climate, high political risk, or the unprofitability for investors operating in Myanmar. The over extraction of non-renewable natural resources sectors of the countries can't explain the long run substantial development for Myanmar.

In 2011, under the new civilian government launched a series of political, economic and administrative reforms and the economic reform agenda emphasized on good governance, transparency and accountability while including measures for attracting FDI, liberalizing trade, enhancing regional economic cooperation by reducing the state's economic role, boosting productivity and balancing equity with efficiency.

Figure 10. FDI by Sectors Under Initiative Civilian Government and Democratic Government
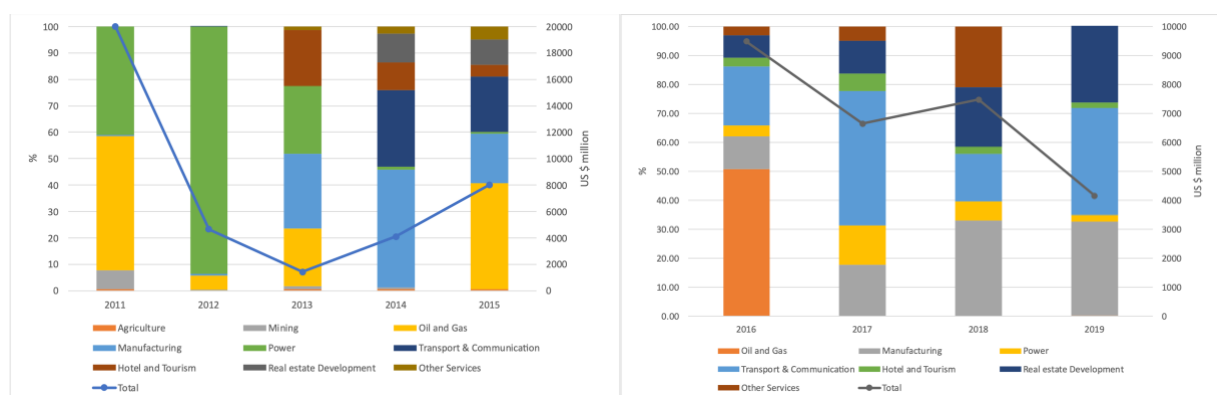
Source: Myanmar Statistical Year Books

Although the structure of FDI started change after economic reforms under this civilian government, the power sector and oil and gas sectors still exist the main receiver. The FDI in manufacturing and transport and communication sectors was started to increase in the share of FDI as a result of revised the FDI law to attract the foreign investors. The FDI commitments was about rose sharply in 2015 by rose in the 40 percent of oil and gas sector and the investment commitments in telecommunication and manufacturing sectors was rapidly grew about 20 percent.

Under the new democratic government especially in 2016 to 17, the sharp drop of FDI was due to lack of commitments in the oil and gas sector. Indeed, the previous governments enjoyed a huge amount of FDI commitments in the oil and gas sector in last two government era. Because of the over extraction of oil and gas in previous year, the slowdown in natural resources also included one of the reasons to reduce emphasis on the oil and gas exploitation and conservation of the natural resources. In 2019, the FDI decrease again because of pandemic that impact to slowdown the economic traction by pause up the economic activities.

FDI commitments declined sharply during the first seven months of 2021 when compared with the period last year by 63 percent because of the dual shocks of COVID-19 and the military coup that have prompted investors either to delay or withdraw investment decisions.

Figure 11. FDI Commitments in the End of Democratic Government Era and Initial of Military Coup 2021
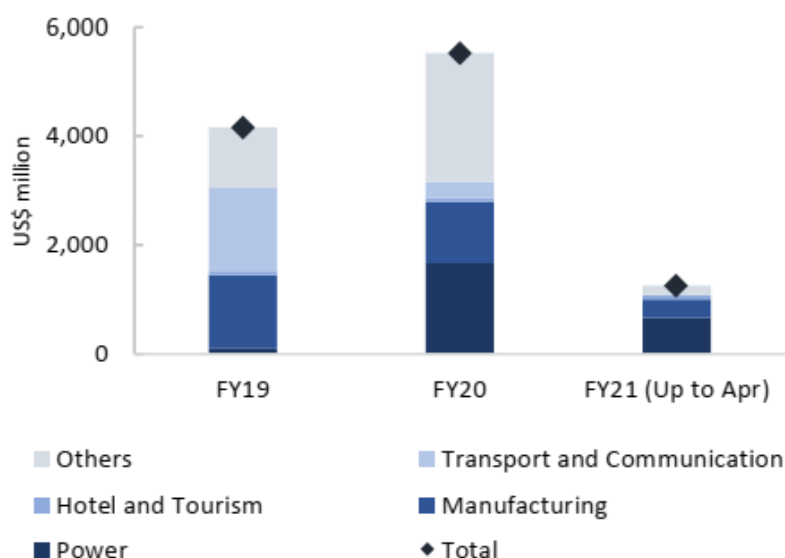
Source: Myanmar Economic Monitor July 2021

Manufacturing and power sectors are likely to remain dominant recipients of FDI 2021, since further investments in those sectors also included an electricity generation project. On the other hand, there were no new investment commitments in major sectors such as oil and gas and the transport and communication sector after military coup. (up to April 2021). These two sectors were major contributors of FDI commitments in Myanmar. After the military coup, the famous investor like Telenor[12], Kirin[13], Toyota[14] etc. removed and postpones their investment. Since February 2021, Military coup, several international firms have announced a suspension of their operations and changed their investment plans in Myanmar. International sanctions have been imposed on certain individuals, businesses, and state-owned enterprises that connecting with the military organization. This political instability and uncertainty reduce the attractiveness of investment in Myanmar.

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[12] Telecommunication from Norway that it reached an agreement to sell 100 percent of its Myanmar operations to Lebanese M1 group for US$105 million.
[13] Kirin Holdings Co. Ltd, Japanese drink giant terminated its joint venture (JV) partnerships with the military controlled Myanmar Economic Holding Ltd (MEHL)
[14] Toyota postponed the plan to open a new plant in Myanmar. It announced a plan to build the US$52.6 million production plant in 2019

2.5 Structural change of the Economy Under Different Government Era

The structural change in Myanmar economy among different government era after 1988 was depicted in the following figure 12. There was no significant structural change had been taken place in Myanmar economy alone over the earlier period of Military rule with the over 50 percent of Agricultural contribution, roundabout of 10 percent of Industry and 30 percent of Service sector in the contribution of GDP. That figure show that Myanmar's income was heavily dependent on the primary sector with lower development of industrial sector under the military rule. In the late 2000s the structural of economy starting change gradually by the increase in contribution of industrial sector in GDP over 20 percent.

Figure 12. Structural Change of Myanmar Economy
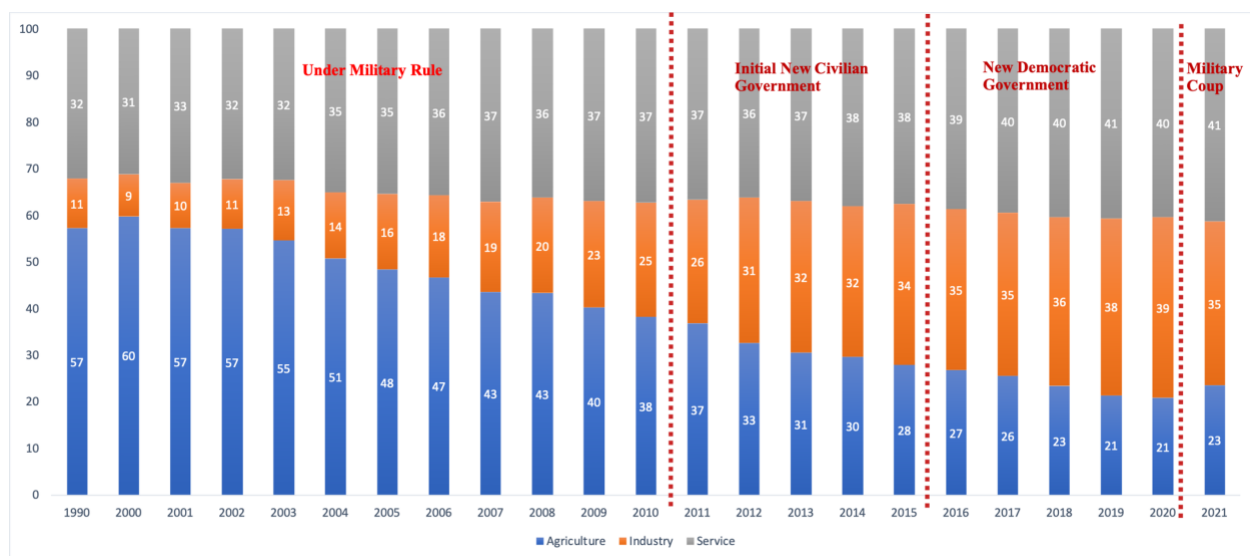
Sources: Myanmar Statistical Year Books, World Bank Data

The structural of economy under the new civilian government was significantly different compare with the previous military rule and increased the contribution of Industry from 10 percent to over 30 percent and reduced the agricultural sector contribution from 50 percent to 30 percent. That structural change can illustrate the developing of industrial sector under the economic and political reforms of the new civilian government. In addition, the structural change accelerates until the new democratic government era and the agricultural contribution reduce to 21 percent,

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by increasing in 39 percent in industry and 40 in services sector in 2020. In February 2021 the military assumed power in Myanmar, setting back the country's democratic transition, and immediately impacting an economy that had already been weakened by COVID-19.

Figure 13. Structural Change Under New Democratic Period and Military Coup
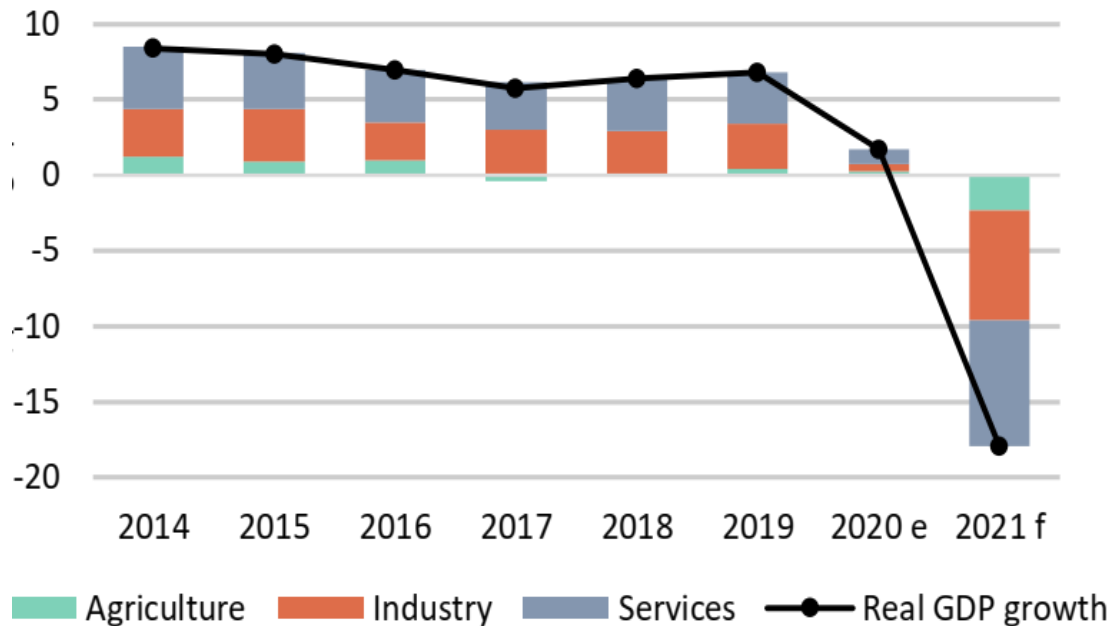
Source: Myanmar Economic Monitor, 2021

The military coup 2021 together with the pandemic, which rapidly worsened the economy significantly. The real GDP growth rate is projected to fall by nearly 20 percent in 2021 consistent with a broad-based contraction across all sectors and the share of industry was decrease and share of agricultural sector increase again. There has a question the setting back the democratic transition would be also retrospective the economic structure to the past with highly depend on primary sector.

<center>**Chapter II**</center>

<center>**Analysis of Exchange Rate Policy Reforms and its Impact on Economic Growth of Myanmar**</center>

1. Introduction

For several decades, the relationship between exchange rate and economic growth has remained a controversial issue amongst policymakers and economists. Both the theories and evidence diverge for several reasons. Notably, the region-wise impact is volatile because the exchange rate significantly impacts developing countries rather than developed economies. Although most economists agree that a poorly managed exchange rate is an impairment for economic growth, it still exists among policymakers. Although the theoretical relationships are ambiguous, evidence suggests a strong link between the choice of the exchange rate regime and macroeconomic performance. Adopting a pegged exchange rate can lead to lower inflation and slower productivity growth. Despite all these facts, the exchange rate is still widely used as a tool in international trade policy and a tool to combat inflationary to forward the economic growth in most developing countries.

There are two main points of conducting an Exchange rate policy. These involve choosing an exchange rate system and determining the rate at which foreign exchange transactions in respectively economy. A country's exchange rate policy affects its relative price structure in domestic currency terms between tradable goods and non-tradable goods produced for the domestic market. Therefore, the exchange rate policy will widely impact the overall economy through the domestic price level (Barth, 1994). Moreover, if the policy's goal is to control inflation, the peg exchange rate regime is the best mechanism. It fosters increasing investment by eliminating policy uncertainty and lowering real interest rates. However, it is accompanied by lowering a vital adjustment mechanism of increasing protectionist pressure, deteriorating the economy's price signals, and promoting the inefficient allocation of resources across sectors. On the other hand, the floating exchange rate regime stimulates productivity growth under the ceteris paribus assumption. Both regimes have both implications and limitations for growth. Economic theories have relatively little to say about how exchange rate impinges on growth; exchange rate effects are discussed

<center>23</center>

indirectly in terms of international trade and investment. Most of these theories encompass misalignment. Real exchange rate misalignment implies some macroeconomic disequilibrium, which is a hinter for growth as loose monetary policy in the presence of a fixed exchange rate may appreciate the domestic currency, causing a sustainable current account deficit and contracts imports. According to Krueger (1983) such exchange rate misalignment would lead to reducing openness and growth. Large overvaluations adversely affect the growth associated with shortages of foreign currency, rent-seeking and corruption, unsustainably sizeable current account, and deficits in the balance of payment crises and deteriorating economic growth.

The exchange rate regime is an essential financial instrument for Myanmar's outward economic orientation. Concerning the expansion of trade and investment and the opening of the economy, reform of the foreign exchange regime is crucial. The existence of multiple exchange rates and the massive disparity between the official exchange rate of Myanmar's currency (kyat or MMK) to the U.S. dollar and the parallel market rate (official rate of around MMK6 vs. MMK800-900 in the parallel market) before unification had led to a considerable distortion in transactions involving foreign currencies. It encouraged the black market for foreign currencies and led to budgetary distortions, as the government of Myanmar used the official rate for its external trading while the private sector was subjected to taxation based on arbitrarily stipulated rates much higher than the official rate. The multiple exchange rates were finally unified in April 2012. Since then, the central bank of Myanmar has held a daily auction to determine a reference rate with the U.S. dollar, the euro and the Singapore dollar. On one set, other banks and money changers can then exchange the kyat within a band of +/- 0.8 percent above or below the reference rate. The new exchange rate mechanism appears to be working well, with the kyat trading at around 953/US$1 on 16 May 2014. (Than, 2014) Although exporters had complained that the MMK was initially overvalued at K818:US$1, the new exchange rate mechanism appears to be working in accordance with market conditions and had gradually depreciated, trading at around K1032:US$1 on January 1, 2015 (Global New Light of Myanmar, January 2, 2015). According to Kubo 2014, though the segmentation of foreign exchange market within the private sector was alleviated, the insulated from the foreign exchange market with the continuation of a form of the soft budget constraint. It was emphasized that reform of the state budget system is essential for the unification of the private sector the bulk of foreign exchange transactions still appears to take place in the parallel market, and it remains a challenge for the CBM and the new government. The management of the exchange

rate is one of a major policy objective in Myanmar to achieve a set of diverse objectives of economic growth, containment of inflation and maintenance of external competitiveness. Policy suggests that a wrongly managed exchange rate regime can be a major impediment for improved economic performance. Reform of the exchange rate management was an important component of trade liberalization measures that Myanmar undertook, eventually replacing the earlier 'fixed exchange rate' system with a 'floating exchange rate' regime.

Since the late 1980s, the Myanmar economy has undergone significant changes. The switch to export-led growth from import substitution resulted in the lifting of major restrictions on the economy placed on it by the government, including the liberalization of the current account and the implementation of a floating exchange rate regime. The major economic problems during the period were inflation and declining output. Output growth performance was poor after the 1960s and 1980s and remained negative at the end of 1980s. In recent years, policy discussions have increasingly included references to real exchange rate stability and correct exchange rate alignment as crucial elements in improving economic performance in Myanmar. The government has considered the exchange rate to be an essential macroeconomic instrument for combating a high inflation problem and a stable financial system, promoting exports, controlling imports, and enhancing economic growth.

The failure of exchange rate policy is one of the significant factors that harmful macroeconomic instability with multiple exchange rate systems and extremely over value of Myanmar kyat in terms of the official rate. An overvalued real exchange rate affects the production pattern and level, the allocation of expenditure, the distribution and level of factor payments, the composition and size of trade flows, the level of international reserves and external debts, and the parallel foreign exchange markets, and currency substitution and capital flight. Further, persistent real overvaluation also seriously erodes business and consumer confidence, thereby lowering the rate of savings and investment, adversely impacting economic growth. (Tarawalie, 2010)

Previous empirical literature studies the link between the real effective exchange rate and GDP and can identify two channels by which real exchange rate affects GDP; these are the aggregate demand and aggregate supply channels. In the aggregate demand channel, a real exchange rate depreciation enhances the international competitiveness of domestic goods, boosts net exports, and hence increases GDP. The aggregate supply channel posits that the real exchange rate depreciation increases the cost of production (and hence reduced GDP) and helps redistribute income in favor

of the rich. Some studies argue that real depreciation has expansionary effects on real output growth. [15] On the other hand, others have argued that real exchange rate depreciation has contractionary effects[16]. Because of these conflicting results, it is clear that the impact of exchange rate devaluation on real output growth remains an unresolved issue in the empirical literature.

Therefore, this study examines the nexus of exchange rate and output growth (GDP) in Myanmar. This study contributes to finding out the following questions. First and foremost, how does the exchange rate have a long-run and short-run dynamic impact on the country's economic growth rate? Secondly, how do the real exchange rate, inflation, interest rate, and economic growth influence each other? Thirdly, how do exchange rate policy reforms significantly impact the country's economic growth? Fundamentally, the period of the study was fractured into three prominent distinctions of the political era- the era of the market-oriented economy under military rule from 1988 to 2011; the era of Economic Liberalization under U Thein Sein Government from 2011 to 2015; the era of New democratic government under the leading of National League for Democracy (NLD) from 2016 to 2019. Unfortunately, growth potential was harmful because of the military coup after 1st Feb 2021.

This study employed the Vector Autoregressive VAR model to explore the relationship between the exchange rate and the economic growth of Myanmar and the influence of employed variables in the systems. And then explicitly focusing on the Impulse Response factor and forecast error variance decomposition. In addition, this study adopted the Vector Error Correction (VECM)technique to perceive the model's long-run relationship and short-run dynamic. This study finds that in the long run, the real exchange rate has a positive impact while inflation debilitates the real GDP growth rate of Myanmar. However, the real exchange rate has no short-term dynamic impact on the real GDP growth of Myanmar. In addition, the 2011 CBM policy reform of the exchange rate do have significant impact on the country's growth rate. Therefore, the policy reforms provide the positive effect in the leading of sustainable growth with price stability. The remaining portion of the paper is structured into four parts. The second part is the literature review and theoretical framework; the third is the analytical methodology. The fourth part is for empirical results and the final portion is the conclusion and policy implication respectively.

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[15] See Cooper, 1971; Gylfson & Schmid, 1983
[16] Edwards, 1989; Agénor, 1991; Morley, 1992

2. Brief Review on Exchange rate Policy and Economic Growth of Myanmar

Myanmar's multiple exchange rate system creates various economic distortions (Hori and Wong, 2008). Prior to the reform, since 1977, the multiple exchange rate system was implemented in Myanmar. That allowed Myanmar Kyat to have two different rates: official rate (fixed, pegged with special drawing rights of IMF) and Market rate (floating, determined by currency market performance which reflects supply and demand of the Kyat against foreign currency). The official rate, pegged with 1SDR=8.5 Kyats, was only applied to the public sector for fiscal accounting of such administrative allocation of foreign exchange (IMF, 2012). Moreover, the other elite groups that can use this official rate are the business groups, dominated mainly by the military and a few cronies with a strong relationship with the military and restricted to ordinary people. Therefore, ordinary individuals of Civilians and most of private sector transactions can only use the floating market exchange rate, which is unstable, weaker, and illegal that appear by determination of market performance, which reflects the supply and demand of the Kyat. That situation creates corruption and profit-seeking by the junta and their relative crony businessmen as the elites to monopolize the currency market. That was the crucial source of stimulation for emerging the parallel black market exchange rate and other chaotic economic situations in Myanmar's economy through chronicle inflation and economic deterioration.

While there has been a greater use of informal exchange rates by private sector agents over the years and that system was nontransparent and creates various distortions and imposes high costs on participants. Under this policy, the segmentation of foreign exchange market between the public sector and private sectors is very huge and the parallel black market exchange rate depreciated around 40 kyats per USD to nearly 1300 kyats per USD during 1988- 2007. The official exchange rate fixed by the government was overvalue value and differed from over 200 times when compared with the market exchange rate in 2007.The margins between official and unofficial rates lead to deceit actions and thus contributing to economic instability and even uncertainty inside the country.

The exchange rate is one of the most essential tools in economic development. In Myanmar, this overvalued official exchange rate undermined economic activity involving all tradable goods of the countries. The persistence of this situation suffered the country's industrial base to shrink, discouraged the investors, encouraged the migration of the workers because of the lack of job creation in the country, wider the poverty gap between the rich and poor, and forced to deepen the

poverty. Furthermore, the inconsistency of the currency exchange rate system of the country is also born to illicit economic activities, such as the black currency market and other related problems. In order to conduct trading with other countries, enterprises with no access to the official rate will exchange the currency in the black market. As a result, this practice affects the competitiveness of the products sold using the unofficial rate compared to products sold using the official rate. It implies that, in an open competition, state-owned enterprises are in the market rather than non-state-owned enterprises that do not have any access to the stronger official rate.

Moreover, the privatization of enterprise by the military in 1989 also created the new state-controlled economy regime. Due to military domination, the official exchange rate is limited for those with access to the government, such as military members, relatives, family members, and crony businessmen. By utilizing their privileges over economic activities, military and crony businessmen monopolize the currency market and other major economic activities, such as international trade. Monopoly over the official rate gives barriers to enterprises other than state-owned enterprises to develop and expand their businesses. This situation gives Myanmar some consequences, such as unemployment, difficulties in exporting, slow economic growth, and poverty. Therefore, Myanmar needs to address the problem of the overvalued official exchange rate and the growing illegal black market of the exchange rate; otherwise, the substantial economic damage will be unavoidable in the longer run. This is the reason why imperative to establish mechanisms and procedures to keep the exchange rate at levels that maintain the economy's competitiveness and promote the country's economic strength.

To overcome historical distortion of the economy and prevent further severe deterioration, the Myanmar government needs to address the problem of parallel exchange rates and overvalued official exchange rates instantaneously. Many analysts have long insisted that the government undertake reforms to unify the multiple exchange rates. The most appropriate solution to fix that chronic problem is for the government to address the overvalued exchange rate, unify the exchange rates system, and abolish the official rate by increasing the supply of kyat relative to the dollar in the economy, pointed out by Dapice and Vallely in 2011. Moreover, allowing the Central Bank to manage exchange rates and the Central Banks or state banks could purchase dollars at market rates to increase the supply of kyat and reduce the volume of dollars in circulation. Similarly, disbursement of planned expenditures and an increase in the supply of kyat in the economy will help reduce the overvalued exchange rate because the demand for kyat to pay for state assets,

including land, is one of the root causes of the problem of an overvalued exchange rate. Pay a role of Central Bank, and autonomy Central Bank control of supply of kyat and ability to tighten credit may prevent too undervalued problem without printing money to finance large fiscal deficits. Permit lower fiscal deficits and the issuance of bonds.

There can be no solution to an overvalued exchange rate without unification of the currency to fix the problem. Success in solving the problem of Myanmar's overvalued exchange rate should, in turn, lead to the broad-based budgetary, financial, and monetary reforms necessary to sustain an exchange rate that makes the Myanmar economy competitive. These reforms will not be easy. Procedures will have to be modified, the capacity of the staff involved will have to be improved, and the needed changes will have to be adapted to the institutional circumstances in Myanmar.

There is a clear consensus, Following unification, a range of other important policy interventions will immediately become possible. The Central Bank can buy dollars with kyat in order to move the nominal exchange rate to its desired level. Such measures as spending more budgeted funds, allowing dollar purchases of state assets, including land, and permitting state and private banks to deal in foreign currency at market rates will also help resolve this problem. In the longer run, using taxes or bond sale proceeds to fund government spending instead of printing money will make maintaining moderate monetary growth, low inflation, and a competitive and stable exchange rate easier.

To overcome the problematic exchange rate policy, which distortion Myanmar's economic activities unifying the currency exchange rate system becomes the first step towards economic reform in Myanmar. Unifying the multiple rates would allow Myanmar to benefit from a more efficient allocation of resources. Since 2010, Myanmar has gained its reform momentum. Economic reform is crucial to political reform because Myanmar has experienced prolonged economic instability and stagnation. Initial reforms conducted by the government have given rise to further reforms in the broader aspect. In April 2012, Myanmar's new government implemented the foreign exchange policy reforms and moved to a managed floating regime from the de facto multiple exchange rate system. After that, the country began unifying the official rate and market rate to produce a unique and practical exchange rate for the domestic currency. After implementing the exchange rate unification policy, the segmentation between two historical difference rates reduced from over 200 times in 2007 to nearly zero after 2012. The following Figure 3.1 illustrates the market and official exchange rate of Myanmar from 1988 to 2020.

Figure 1 Official and Market Exchange Rate of Myanmar
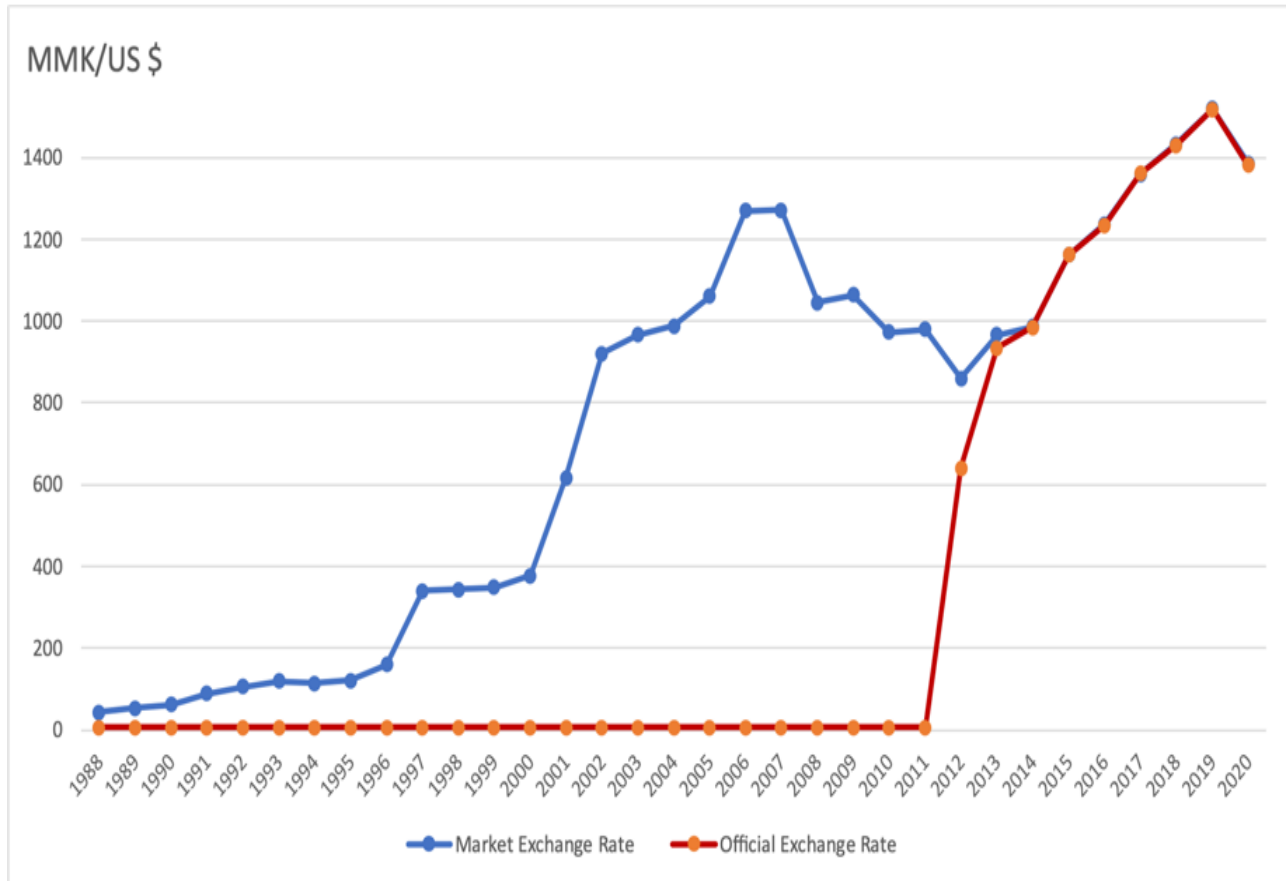
Source: World Bank, Central Bank of Myanmar, Thein Phyu Private Foreign   Exchange Market

In 2015, National League for Democracy (NLD) won the election, and the Leader Aung San Su Kyi also led various political and economic reforms. Under the new government, the policy focuses on sustainable macroeconomic stability, an indispensable prerequisite for peace, security, and many other SDGs. It prioritizes establishing appropriate fiscal, monetary, and exchange rate policies, improving Myanmar's balance of payments, and maintaining inflation appropriately. Inflation and exchange rate stability are closely correlated, especially in nominal terms. High exchange rate volatility is detrimental to export growth, the flow of foreign direct investment, and overall economic growth. Thus, the real effective exchange rate of the kyat has primarily been relatively stable.   Inflation must be stabilized to maintain monetary stability. In contrast, the nominal effective exchange rate has at times depreciated drastically, especially during periods of

high relative inflation. Therefore, the effective management of the exchange rate is still considered to acquire the policy gold of stabilized growth of the economy.

This collaborative problem has destroyed the competitiveness of much domestic economic activity was led to a crisis in Myanmar. Inflation imposes real burdens on an economy's producers and its poorest members with declining purchasing power. For foreign investors, high inflation rates and rapid exchange rate fluctuations are a sign of poor economic management. This is the reason why rapidly industrializing Asian economies have attached great importance to combating inflation.

An overvalued exchange rate combined with inflation is particularly disastrous for the economy because inflation drives up production costs. Inflation in Myanmar is mainly due to rapid increases in the money supply. While real increases in output can grow sustainably at 6-8% per year, Myanmar's money supply has generally grown at 25% or so per year. As a result, prices in Myanmar rise by 15-20% per year. Slower increases in the money supply and interest rates on kyat deposits that exceed the inflation rate could bring the inflation rate to single digits. With lower inflation, interest rates will drop. An overvalued exchange rate is a barrier to this sequence of desirable developments. The following figure shows the inflation in Myanmar from 1988 to 2019.

Figure 2 Inflation Rate of Myanmar
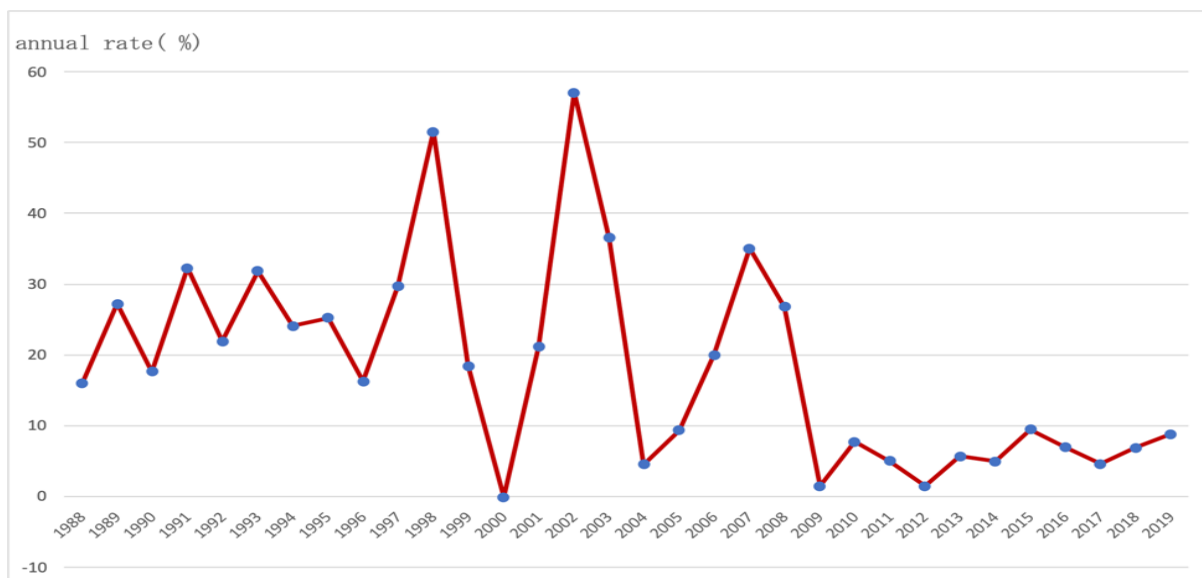
Source: World Bank

The inflation in Myanmar was induced by the inefficient socialist policies of the 1960s. The extent of inflation in Myanmar for over 30 years, from 1988 to 2020, is depicted in Figure. The Figure shows a giant fluctuation of the inflation rate with a high double-digit increase in 1988 and 2002. High money supply growth to finance budget deficits and heavy government expenditures describe the fiscal and monetary aspects of causing inflation.

And then several other cost-push factors include using out-of-date machinery and equipment in production, and the inefficient state-owned enterprises contribute to wastage and high production costs. In addition, Outdated, complex, and unaccountable laws and regulations create delays and uncertainty and add up production costs. These various cost-push factors were identified as responsible for such a high inflation rate in Myanmar. In the aspect of the balance of payment, deteriorating external value of the currency, causing increased cost of imported inputs and goods that also the key role of the cause higher inflation of the country. The establishment of new development by Myanmar authorities pushed costs further up. Government activities under the impact of gasoline price hike, heavy cost of shifting to the national capital Naypyitaw, and raising salaries of public employees were the other reason for the growing up inflation in the country.

Misallocating scarce resources with heavy wastage and high costs caused inflation to take root. It had been fueled later by the irrational and inappropriate policies of market and prices, budget and expenditure allocations, and exchange rates, among others. Myanmar pursued a variant of a centrally planned economy from 1974 to 1988. Only the state sector was allowed to undertake international trade during this period. Partially due to its inward-looking economic policy and economic mismanagement, the country was in and balance of payments and external debt crises in the 1980s, thus gaining the least developed country status (Myat Thein 2004).

In a deep economic downturn in September 1988, the military staged a coup d'état. Once assuming office, it commenced economic reforms to transition to a market-based economy. However, the incomplete reforms stimulated large informal economic activities. While legalizing international trade in the private sector, the junta left intact the overvalued official exchange rate pegged to the IMF's special drawing right (SDR) and the central administration of foreign exchange allocation in the state sector. Nonetheless, the junta imposed extensive exchange restrictions on the private sector to affect their use of the foreign exchange. The restrictions

eventually stimulated smuggling and informal money transfers in addition to informal currency deals, further complicating the forex market structure.

Among the gamut of political and economic reforms launched by President Thein Sein's government since March 2011, the series of reforms affecting the foreign exchange market has yielded the most visible changes. While these changes are highly visible, the substantive effects of the reforms on real economic activities are not so clear.

Figure 3 Historical Real GDP Growth Rate of Myanmar
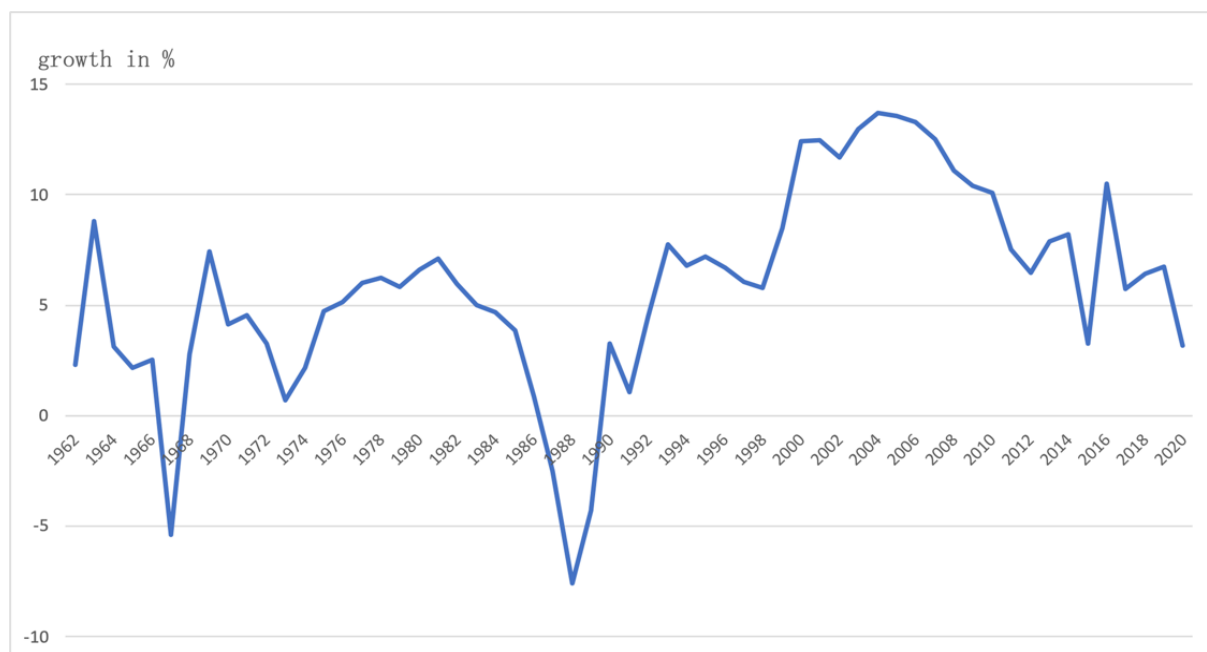
Source: World Bank

The GDP growth rate of Myanmar from 1988 to 2020 is shown in Figure (3). Most analysts have doubts about Myanmar's official GDP growth rates; the ESCAP estimated Myanmar's economy to grow by 5% in 2005, while the IMF estimated a range of 3.2% to 5.3% for four years from 2004 to 2007. But Myanmar's rates were extraordinarily high, with a double-digit growth rate between 2000 to 2007. For 2007, Myanmar's official GDP growth estimate was 11.9%, but few, if any, accept it as realistic. A continuous real GDP growth rate of over 12% for a decade in a row is impossible unless a favorable environment persisted for that decade. The double-digit growth rate was acquired from 2000 to 2007, which most analyst doubted. After the 2012 reforms, the economy grew with a 6.5% average growth rate. In 2016, the growth rate increased to two

digits again during the period of the democratic government of lead by NLD. In 2020, the growth rate goes down again because of the pandemic crisis of Covid-19.

The primary objective of the Central Bank of Myanmar (CBM) is to control the price stabilities in the domestic market and to preserve the internal and external value of the Myanmar Currency, the kyat. To attain such objectives, the CBM promotes efficient payment mechanisms and has adopted Monetary Targeting Monetary Policy Framework since 2012. (CBM, 2014) Under the Exchange Rate Policy of this framework, the CBM introduced Managed Floating Exchange Rate Regime in April 2012. The reference exchange rate with US Dollar is determined based on the Auction mechanism, which reflects the market demand and supply. No particular exchange level is targeted, the exchange rate is market-determined, and intervention is to avoid redundant volatility. The CBM has conducted a daily foreign exchange Auction every business day since April 2012. Interbank foreign exchange market has been conducted every business day since August 2013.

In February 2019, the CBM shifted the reference rate determination mechanism from a foreign exchange auction-based system to a market-based determination system. The CBM terminated a two-way foreign exchange auction in November 2019 and introduced a rule-based one-way foreign exchange auction to reduce short-term exchange rate volatility and accumulate foreign exchange reserves. During the financial year 2019-2020, the highest and lowest reference exchange rates were 1535 kyat and 1308 kyat, respectively, and the average exchange rate was 1426 kyat. During the financial year 2019-2020, the reference exchange rate had appreciated by 15 percent since the exchange rate went down to 1308.5 kyats in September 2020 from 1532.8 kyats in Sep 2019. The central bank of Myanmar is standing ready to intervene by dealing with USD through foreign exchange auctions to facilitate smooth transactions in the foreign exchange market and foster convergence among existing exchange rates to avoid redundant exchange rate volatility. (CBM, 2020)

From 1988 to 2020, there are two noticeable distinctions between the government era- the military government era and the democratic government era. The study reviewed the exchange rate policy reforms of Myanmar in this different government era and examined the impact of these policy reforms on the country's economic growth.

3. Literature Review and Theoretical Framework

The world is becoming globalized, and the country which isolated from the external economic activities might be left with slow growth. Therefore, no country can stand alone and try to interact with each other for economic interests and political strategies. Therefore, to have competitiveness of the economy is one of the prominent factors that policy makers for review, and exchange rate policy become a significant factor that can influence not only the foreign trade improvement but also the foreign capital acquirement and economic growth.

3.1. Review on the linkages between exchange rate and economic growth

The previous literature explored the exchange rate and economic growth have different results. Bo Tang (2015) examined the relationship between the real exchange rate and economic growth in China by applying a cointegrated VAR model. That analytical study found that the Chinese Economy has not benefited from the lower exchange rate of the RMB, and no direct linkages exist between the real exchange rate and growth in the long run. However, the Chinese Economy was stimulated by the expansion of exports and the inflow of foreign capital. According to the empirical evidence, which also suggests that the long-term equilibrium real exchange rate is jointly determined by the foreign trade, foreign reserves, and the foreign direct investment.

Obama et al. studied the relationship between exchange rate, interest rate, and economic growth in the Nigerian Economy by adopting the vector auto-regression technique with specific emphasis on the Impulse Response factor and the Forecast Error Variance Decomposition. The result of this study indicated that the exchange rate had a more robust impact on economic growth than interest rate. In addition, the exchange liberalization was good for the Nigerian Economy as it promoted economic growth. Razzaque et al. (2017) examined the effect of exchange rate movements on economic growth of Bangladesh by using cointegration techniques to determine the output response to Bangladeshi currency depreciation. This analysis result suggested that the 10 percent depreciation of the real exchange rate can rise 3.2 percent in the country's aggregate output in the long run. However, the contractionary effect of real depreciation by same magnitude would result in a half percent decline in GDP. In contrast, the long-run expansionary effect of real depreciation may be appealing for considering exchange rate policy as a development strategy. The likelihood of rising inflationary pressures should be kept in mind while pursuing the policy option.

Aman et al., explored the relationship between exchange rate and economic growth in Pakistan by using a simultaneous equation model of two and three-stage least square (2SLS and 3SLS) techniques. The exchange rate positively affects economic growth through the channel of export promotion incentives, enlarging the volume of investment, enhancing FDI inflow, and promoting the import substitute industry. Although the exchange rate positively affects economic growth, it can't be used as a policy tool. Tarawal(2010) examined the impact of the real effective exchange rate on Sierra Leone's economic growth by employing a bivariate Granger Causality test. Evidence of the real effective exchange rate causing economic growth was profound. The main determinants of the real exchange rate in Sierra Leone are terms of trade, exchange rate devaluation, investment to GDP ratio, and an excessive supply of domestic credit. The real effective exchange rate correlates positively with economic growth, with a statistically significant coefficient, and monetary policy is relatively more effective than fiscal policy in the long run.

Dani Rodrik (2008) analyzed how the real exchange rate affects economic growth by using different measures of the real exchange rate and different estimation techniques. That analysis can prove that the undervaluation of the currency (a high real exchange rate) stimulates economic growth, particularly in developing countries. In addition, studies also suggested that tradable suffer disproportionately from the government or market failures: institutional weakness and product-market failures. Ronald MacDonald (2002) explored the connection between exchange rates and economic processes and pointed out key features of flexible exchange rates, which are highly volatile and may affect growth through trade and investment channels. This research used Balassa-Samuelson and Houthakker-Mgee-Krugman's hypothesis to analyze the links between sectoral and aggregate growth and the exchange rate. As a result, the exchange rate arrangements for both internal and external of the euro-zone area during the research period stimulated economic growth.

Suna Korkmaz (2013) studied the effect of exchange rate on economic growth in nine randomly selected European countries by applying panel data analysis and the Granger Causality test. That study recognized the causality of exchange rate towards economic growth for the nine European countries. Kogid et al., (2011) investigated the effects of both real and nominal exchange rates on economic growth in Malaysia by using the ARDL approach. That analysis results in both nominal and real exchange rates similarly affecting economic growth. The ARDL bounds test suggests that long-run cointegration exists between exchange rate and economic growth with significant positive

effects. In addition, the systematic exchange rate via monetary policy should be properly developed to promote the stability and sustainability of economic growth in Malaysia.

3.2. Review the Impact of exchange rate regime on growth

In macroeconomic policy, the choice of exchange rate regime and its impact on economic performance is a controversial factor until current years. The exchange rate regime have different economic results depending on the economy's size and development status. Study in the past explored the impact of choosing an exchange regime on macroeconomic performance and has found contrary results. Ghosh et al., 1996 point out there was a strong link between the choice of the exchange rate regime and macroeconomic performance. The exchange rate regime influences growth through investment and international trade. The stud classified the exchange rate as fixed, floating, and intermediate. Growth was faster under the intermediate regime than in the floating regime and lowered under the pegged regime. However, this pattern is only applicable in lower-middle and low-income countries because, in the case of the industrial and upper-middle-income countries, growth was somewhat higher under pegged rates. The analysis showed that the economy adopting a pegged exchange rate can lead to lower inflation and slower productivity growth. The choice of exchange rate regime is more important for low-income countries than for high-income countries.

Moreover, Jeffrey Frankel et al. (2019) found that the relationship between exchange rate regimes and economic growth varies among countries at different income levels. In their analysis, they constructed a new database characterizing the de facto exchange rate regime from 145 countries and investigated this relationship. Their finding illustrated that the intermediate exchange rate regime is positively related to economic growth at the most incredible significance level.

In contrast, In 2019, Dao et al. analyzed Asia's exchange rate regime and economic growth by employing the Generalized Method of Moment technique on unbalanced panel data. The results found that the affixed exchange rate regime will affect economic growth in the same direction. This means that the country with a less flexible exchange rate regime will have higher growth. Bailliu et al. examined the impact of exchange rate arrangements on growth using panel-data analysis and found that exchange rate regimes characterized by a monetary policy anchor, whether pegged, intermediate, or flexible, exert a positive influence on economic growth. In addition, flexible exchange rate regimes without an anchor are detrimental to growth. Therefore, the

presence of a monetary policy anchor, rather than the type of exchange rate regime per se, is crucial for economic growth.

However, Vita and Kyaw (2011) proved that there was a lack of solid relation between the choice of exchange rate regime and economic growth in the long run by employing fixed effects panel estimation on 70 developing countries. In addition, Fristedt (2016) investigated the choice of exchange rate regime effect on economic growth by studying different development levels of countries. That study applied the cross-sectional regression estimation of 60 countries and found out the choice of exchange rate regime holds no significant explanatory power over economic growth. Although no robust direct relationship was found, these findings support the argument that the choice of the regime may indeed affect growth indirectly through its impact on other deterministic factors, such as trade, investment, and productivity.

The study by Levy-Yeyati and Sturzenegger in 2003 found contrasting results from the previous findings. They analyzed 183 countries and, according to their finding, the growth of developing countries was slower with fixed exchange rate regimes as well as with greater output volatility. Nevertheless, the exchange rate regime did not appear to significantly impact growth in the industrial countries. The study of exchange rate regimes and growth in Central and Eastern European Countries was explored by Ihnatov and Capraru in 2012. They employed the Ordinary Least Square and Generalized Method of Moment to estimate a growth model with dummy variables that isolate the effect of exchange rate regimes on economic growth. Their results suggest the effect of the floating and intermediate regimes is superior compared to the fixed regimes arrangements. In recent years, the study by Ha and Hoang in 2020 provided an empirical analysis of the impact of the exchange rate regime on growth. They apply the Generalized Method of Moments technique for unbalanced panel data of Asian countries. Their empirical results suggest that a fixed exchange rate regime affects economic growth in the same direction; this means that the country with a fixed exchange rate positively impacts growth. Therefore, it can be seen that the controversy on exchange rate policy is unresolvable until nowadays.

Figure 4 Theoretical Framework of the Study

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                    ┌──────────────┐                        ┌──────────────┐    ┌──────────────┐
                    │  Aggregrate  │    ┌──────────────┐     │  Investment  │────│    Growth    │
                    │Demand Channel│────│Exchange Rate │     └──────────────┘    └──────────────┘
 ┌──────────────┐  ╱│              │    │  Movement    │╲    ┌──────────────┐    ┌──────────────┐
 │Exchange Rate │ ╱ └──────────────┘    └──────────────┘ ╲  │    Trade     │    │    Growth    │
 │    Policy    │                                            └──────────────┘    └──────────────┘
 └──────────────┘ ╲ ┌──────────────┐                        ┌──────────────┐    ┌──────────────┐
                   ╲│  Aggregrate  │    ┌──────────────┐     │   Cost of    │    │    Growth    │
                    │Supply Channel│────│Exchange Rate │─────│  Production  │    └──────────────┘
                    └──────────────┘    └──────────────┘     └──────────────┘
```
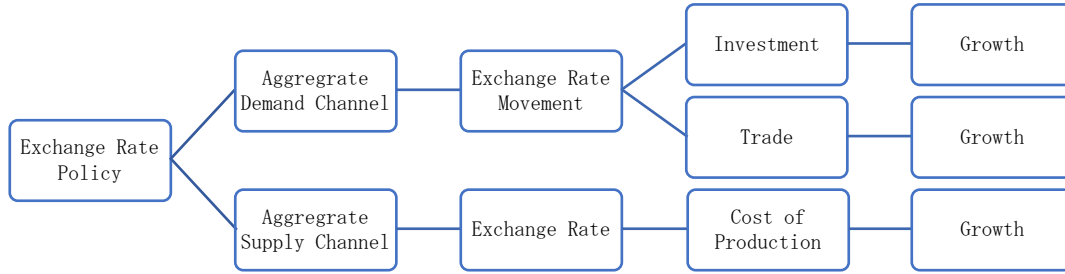
These are the aggregate demand and aggregate supply channels of exchange rate on economic growth. In the aggregate demand channel, a real exchange rate depreciation enhances the international competitiveness of domestic goods, boosts net exports, and hence increases GDP when the Marshall lenner condition are exists. On the other hand, the aggregate supply channel posits that the real exchange rate depreciation increases the cost of production (and hence reduced GDP) and helps redistribute income in favor of the rich. The case of exchange rate appreciation is vice visa.

4. Analytical Methodology

4.1. Data

To explore the purpose of the analysis, the data utilizes in this study are mainly acquired from the world bank, International Monetary Fund (IMF) and Central Bank of Myanmar. The frequency of data is yearly, and it cover to study period from 1988-2019. The occupied selected data in this study are Real GDP (RGDP), Exchange Rate of Myanmar's Kyats (MMK) against the US dollar($) (MMK/$), US and Myanmar CPI as a proxy of the foreign and domestic price index, foreign exchange reserve (FER), exports (EX), Imports (IM). The annual time series data of real growth rate of Real Gross Domestic Product (RGDP) as a proxy of economic growth and it acquire from the World Bank data source. The data for inflation (INF) and interest rate (RIR) are also access from the world bank and the data for real exchange rate (RER) is calculated by the general definition of real exchange rate. RER is adjusting the nominal exchange rate (NER) with foreign (P_t^*) and domestic (P_t) price levels $RER_t = NER_t(P_t^*/P_t)$. These require data which need to

calculated RER was used from the Central Bank of Myanmar and International Financial Statistics (IFS) of IMF. All variables in the series are expressed as logarithmic forms.

4.2. Foundation of the Models

In this empirical study, two types of models are employed to explore the research objectives. Vector Autoregressive (VAR) model was applied to explore the simultaneous relationship between real GDP growth rate and inflation rate. And then, Vector Error Correction Model (VECM) was employed to analyze the long-run and short-run dynamics of GDP, exchange rate, foreign exchange research, export, import, and FDI.

4.2.1. Model I: Specify Vector Autoregressive (VAR) Model for System Analysis

VAR models provide a coherent and credible approach to data description, forecasting, structural inference, and policy analysis. First and foremost, to explore the relationship between exchange rate, inflation rate, interest rate, and economic growth in Myanmar, the Vector Autoregressive (VAR) model was operated. Previous researchers[17] implied that these kinds of variables should all be treated equally without a priori distinction between endogenous and exogenous variables. This concept is satisfied with the VAR model, which has been employed in several studies. Christopher Sims (1980) initiated the popularity of the VAR model in his research of macroeconomics and reality. Afterward, various analysis concerning the forecast of macroeconomic variables such as GDP, inflation, interest rate, etc, and policy analysis widely used the VAR model. In the VAR model, each variable is regressed both its own lag and the lags of other variables in the system. This process grants each variable to be affected by its own past values and the past values of every other variable in the system. This is the crucial point to minimize the problem of simultaneity.[18] Therefore; the VAR model can construct and depict simultaneous relationships between exchange rate, inflation rate, interest rate, and economic growth in Myanmar as follow:

$$lnRGDP_t = \alpha + \sum_{i=1}^{\rho} \varphi_i \, lnRGDP_{t-i} + \sum_{j=1}^{\rho} \theta_j \, lnRER_{t-j} + \sum_{k=1}^{\rho} \pi_k \, lnINF_{t-k} +$$
$$\sum_{m=1}^{\rho} \mu_m \, lnRIR_{t-m} + \varepsilon_{1t} \tag{1}$$

---

17 Such as Sims(1989) and Todd(1990)

18 See (Kretzer, 1992)

$$lnRER_t = \beta + \sum_{i=1}^{\rho} \varphi_i\, lnRG_{t-i} + \sum_{j=1}^{\rho} \theta_j\, lnRER_{t-j} + \sum_{k=1}^{\rho} \pi_k\, lnINF_{t-k} +$$

$$\sum_{m=1}^{\rho} \mu_m\, lnRIR_{t-m} + \varepsilon_{2t} \tag{2}$$

$$lnINF_t = \gamma + \sum_{i=1}^{\rho} \varphi_i\, lnRGDP_{t-i} + \sum_{j=1}^{\rho} \theta_j\, lnRER_{t-j} + \sum_{k=1}^{\rho} \pi_k\, lnINF_{t-k} +$$

$$\sum_{m=1}^{\rho} \mu_m\, lnRIR_{t-m} + \varepsilon_{3t} \tag{3}$$

$$lnRIR_t = \delta + \sum_{i=1}^{\rho} \varphi_i\, lnRGDP_{t-i} + \sum_{j=1}^{\rho} \theta_j\, lnRER_{t-j} + \sum_{k=1}^{\rho} \pi_k\, lnINF_{t-k} +$$

$$\sum_{m=1}^{\rho} \mu_m\, lnRIR_{t-m} + \varepsilon_{4t} \tag{4}$$

where, RER_t and RER_{t-1} real GDP growth and its lagged value respectively. RER_t and RER_{t-1} is real exchange and its lage value and INF_t and INF_{t-1} is for inflation rate and its legged value.

4.2.2. Model II: Defined the Vector Error Correction Model (VECM)

In examining the long-run and short-run relationship between the real exchange rate and economic growth in Myanmar follows the studies of Aguirre and Calderón (2005) and Wang et al. (2007) and then applies the Johansen cointegration approach. The Johansen cointegration approach is also known as the cointegrated VAR approach. It requires that all the endogenous variables in the system have the same integration of order one (Johansen & Juselius, 1990; Johansen & Juselius, 1992). Restricts the long-run behaviors of endogenous variables to converge to their cointegrating relationship. The vector error correction model of the system equation for Myanmar can be expressed as follow:

$$\Delta lnRGDP_t = \alpha + \sum_{i=1}^{\rho-1} \phi_i\, \Delta lnRGDP_{t-i} + \sum_{j=1}^{\rho-1} \psi_j\, \Delta lnRER_{t-j} +$$

$$\sum_{k=1}^{\rho-1} \eth_k\, \Delta lnFER_{t-k} \sum_{m=1}^{\rho-1} \Omega_m\, \Delta lnEX_{t-m} + \sum_{n=1}^{\rho-1} \Pi_n\, \Delta lnIM_{t-n} +$$

$$\sum_{q=1}^{\rho-1} \Gamma_q\, \Delta lnFDI_{t-q} + \lambda_1 ETC_{t-1} + \varepsilon_{1t} \tag{5}$$

$$\Delta lnRER_t = \beta + \sum_{i=1}^{\rho-1} \Phi_i\, \Delta lnRG_{t-i} + \sum_{j=1}^{\rho-1} \Psi_j\, \Delta lnRER_{t-j} + \sum_{k=1}^{\rho-1} \eth_k\, \Delta lnFER_{t-k} +$$

$$\sum_{m=1}^{\rho-1} \Omega_m\, \Delta lnEX_{t-m} + \sum_{n=1}^{\rho-1} \Pi_n\, \Delta lnIM_{t-n} + \sum_{q=1}^{\rho-1} \Gamma_q\, \Delta lnFDI_{t-q} + \lambda_2 ETC_{t-1} +$$

$$\varepsilon_{2t} \tag{6}$$

$$\Delta lnFER = \gamma + \sum_{i=1}^{\rho-1} \Psi_i \, \Delta lnRGDP_{t-i} + \sum_{j=1}^{\rho-1} \Psi_j \, \Delta lnRER_{t-j} + \sum_{k=1}^{\rho-1} \eth_k \, \Delta lnFER_{t-k} +$$

$$\sum_{m=1}^{\rho-1} \Omega_m \, \Delta lnEX_{t-m} + \sum_{n=1}^{\rho-1} \Pi_n \, \Delta lnIM_{t-n} + \sum_{q=1}^{\rho-1} \Gamma_q \, \Delta lnFDI_{t-q} + \lambda_3 ETC_{t-1} +$$

$$\varepsilon_{3t} \tag{7}$$

$$\Delta lnEX_t = \delta + \sum_{i=1}^{\rho-1} \Phi_i \, \Delta lnRGDP_{t-i} + \sum_{j=1}^{\rho-1} \Psi_j \, \Delta lnRER_{t-j} + \sum_{k=1}^{\rho-1} \eth_k \, \Delta lnFER_{t-k} +$$

$$\sum_{m=1}^{\rho-1} \Omega_m \, \Delta lnEX_{t-m} + \sum_{n=1}^{\rho-1} \Pi_n \, \Delta lnIM_{t-n} + \sum_{q=1}^{\rho-1} \Gamma_q \, \Delta lnFDI_{t-q} + + \lambda_4 ETC_{t-1} +$$

$$\varepsilon_{4t} \tag{8}$$

$$\Delta lnIM_t = \delta + \sum_{i=1}^{\rho-1} \Phi_i \, \Delta lnRGDP_{t-i} + \sum_{j=1}^{\rho-1} \Psi_j \, \Delta lnRER_{t-j} + \sum_{k=1}^{\rho-1} \eth_k \, \Delta lnFER_{t-k} +$$

$$\sum_{m=1}^{\rho-1} \Omega_m \, \Delta lnEX_{t-m} + \sum_{n=1}^{\rho-1} \Pi_n \, \Delta lnIM_{t-n} + \sum_{q=1}^{\rho-1} \Gamma_q \, \Delta lnFDI_{t-q} + \lambda_5 ETC_{t-1} +$$

$$\varepsilon_{5t} \tag{9}$$

$$\Delta lnFDI_t = \delta + \sum_{i=1}^{\rho-1} \Phi_i \, \Delta lnRGDP_{t-i} + \sum_{j=1}^{\rho-1} \Psi_j \, \Delta lnRER_{t-j} + \sum_{k=1}^{\rho-1} \eth_k \, \Delta lnFER_{t-k} +$$

$$\sum_{m=1}^{\rho-1} \Omega_m \, \Delta lnEX_{t-m} + \sum_{n=1}^{\rho-1} \Pi_n \, \Delta lnIM_{t-n} + \sum_{q=1}^{\rho-1} \Gamma_q \, \Delta lnFDI_{t-q} + \lambda_6 ETC_{t-1} +$$

$$\varepsilon_{6t} \tag{10}$$

where, $lnRGDP_t$ refers to current level of real GDP growth rate as a proxy of economic growth. $lnRGDP_{t-i}$ is lagged value of real GDP growth. $lnRER_t$ and $lnRER_{t-j}$ refers to current and lagged value of real exchange rate. In this analysis the data for real exchange rate is calculated by the product of market exchange by the price ratio of foreign and domestic. $lnINF_t$ and $lnINF_{t-k}$ indicates that current and lagged value of inflation rate. And then, $lnRIR_t$ and $lnRIR_{t-m}$ represents the current and lag value of real interest rate of the country. All the variables in the system are performed in log form. ETC_{t-1} is the error correcting term and also know as the adjustment term o the cointegrating equation in long run model.Where, $\rho - 1$ is the lag length reduced by 1 and $\phi_i, \Psi_j, \eth_k, \Omega_m, \Pi_n$ and Γ_q are short-run dynamic coefficients of the model. λ_i is speed of adjustment parameter with a negative sign and ETC_{t-1} means the error correction terms is lagged value of the residuals obtain from the cointegrating regression of the dependent variable on the regressors. Contains long-run information derived from the long-run cointegrating relationship. And then, ε_{it} is residuals or stochastic error terms often called impulse or innovations or shock. adjustment long-run equilibrium

5. Estimation Technique

For the estimation technique of Model (I), before we employ our analysis by dealing with time-series data, it is essential to establish the stationarity status of the variables in the Model to avoid spurious results (Gujarati, 2005). Therefore, these data would be tested for stationarity using the Augmented Dickey-Fuller (ADF) test proposed by Dickey and Fuller (1981)and Phillips-Perron (1988). Furthermore, to reveal our objective of the analysis, perform the VAR system and to show the impacts of one variable on itself and others, as well as the direction of the relationship over a given time horizon, estimates the Impulse response Function (IRF). Moreover, the forecast error variance decomposition (FEVD)was applied to estimate each variable's relative contributions to the Model's forecast error.

In addition, for Model II, all the VECM system variables are stationary in the first difference level and identify the optimal lag length for the system by lag selection criteria. And then, testing the Johansen cointegration to explore the long-run and short-run dynamic of the relationship between the real exchange rate and economic growth.

6. Empirical Results

Before engaging the regression analysis, the analyzing characteristic of the variables in the series are one of the essential tasks in estimation of time series data. The table 1 and 2 reports the summary statistics and correlations of the variables in the system.

Table 1 Summary Statistics of the Variables in the Models

Variables	Obs	Mean	Sta. Dev	Min	Max	Skewness	Kurtosis
RGDPGR	32	7.6647	5.0017	-11.3524	13.8440	-1.6869	7.6738
RER	32	291.1644	397.369	5.3475	1065.41	1.1259	2.5017
INF	32	18.2921	14.3807	-0.1092	57.0745	0.8845	3.3259
RIR	32	-2.2015	10.9970	-31.5088	12.4809	-0.5844	2.7786
RGDP	32	33983.88	26208.14	7514.7	86931.31	0.0846	0.1540
FER	32	26979.92	29156.53	706.6	89729.47	0.7023	1.9161
EX	32	5282.25	5312.061	167.00	18118.00	0.8748	2.6046
IM	32	5711.813	6456.898	193.00	19355.00	1.1649	2.7586
FDI	32	1024.864	1255.332	7.8066	4733.257	1.5459	4.4711

Table 1 illustrates the descriptive statistics of variables in two models.The average growth rate of the country is 7.67% in study period of 1988-2020). The maximum growth rate of real GDP is reached two digits of over 13% and the minimum growth rate is with two digits of over minus 11%. The real GDP, export, import, and FDI are thousand million in US dollar.

Table 2 Correlations of the Variables in Models

Model		rgdp	rer	fer	ex	im	fdi
II	RGDP	1					
	RER	-0.8051*	1				
	FER	0.8864*	-0.8769*	1			
	EX	0.9906*	-0.7879*	0.8809*	1		
	IM	0.9497*	-0.7335*	0.7919*	0.9474*	1	
	FDI	0.8515*	-0.7146*	0.7607*	0.8176*	0.8943*	1
I		gdpgr	rer	inf	rir		
	RGDPGR	1					
	RER	0.2013	1				
	INF	0.0286	0.7194*	1			
	RIR	0.2686	0.3074	-0.6633*	1		

Table 3.2 shows the correlation between the variables in the system models. In model I, real exchange rate is strongly positive correlated with inflation at 5% significant level. In model II, all variables have strongly correlated each other at 5% significant level. The real exchange rate and growth may have strongly negative relationship at 5% level.

Table 3 Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) Test for Unit root for Model I

Model	Variables	At Level				At First Difference			
		ADF Test statistics	Critical value at 5%	Critical value at 10%	p-value	ADF Test statistics	Critical value at 5%	Critical value at 10%	p-value
ADF	lnRGDPGR	5.088	2.983	2.623	0.000	9.010	2.986	2.624	0.000
	lnRER	1.598	3.709	2.623	0.484	5.423	2.986	2.624	0.000
	lnINF	3.357	2.983	2.623	0.013	5.565	2.986	2.624	0.000
	lnRIR	2.797	2.983	2.623	0.059	6.953	2.989	2.625	0.000
PP	lnRGDPGR	4.890	2.983	2.623	0.000	9.948	2.986	2.624	0.000
	lnRER	1.321	2.983	2.623	0.614	5.891	2.986	2.624	0.000
	lnINF	3.158	2.983	2.623	0.023	7.620	2.986	2.624	0.000
	lnRIR	2.473	2.983	2.623	0.1223	8.030	2.989	2.625	0.000

Note: Estimated results are reported at absolute value

In this study all the variables are tested the unit root with ADF test and Phillips-Perron test. The unit root result presented in Table 3 indicates that, the variables of Model I, apart from FDI other variables in the system are not stationary at the level and all variables are becoming stationary and significant at 5 percent level after taking first difference. Since the variables are integrated I (1) and can continue to next step for testing cointegration and if all variables are cointegrated the model can employ the Cointegrated VAR. Additionally, in the Model II all variables are real GDP growth rate (RGDP), inflation rate (INF) and real interest rate (RIR), in the system are stationary at the level and significant at 5 percent level. Since the variables are found to be stationary at levels and first differencing, the results from the estimation of the models are unlikely to be biased and inconsistent. Therefore, it can proceed the Model II to perform a vector auto-regression (VAR) model.

6.1. Empirical Analysis and Discussion of the Result of Model I (VAR)

6.1.1 Impulse Response Function

The relationship between the exchange rate and economic growth are assessed by using impulse response functions of VAR model. In table 4 present the impulse response of the variables over a three-period horizon. In the first segment of the table, the result indicate that the coefficient of real GDP growth rate is very low; this means that economic growth rate in Myanmar is not flatulate during the study period. The increasing of coefficient as the time horizon is very low. This reveals that growth rate movement in Myanmar economy is sluggish. The coefficient of exchange rate and interest rate are reported to have positive signs, and this means that these two variables exchange rate and interest have positive impact on economy. However, the coefficient of exchange rate is not significant and only coefficient of inflation is significant to explain the growth of the country. The second segment of the table shows the response of real exchange rate to itself, as well as its response to real growth rate, inflation, and interest rate. In this stage only inflation is significant to response the exchange rate. While the third segment shows the response of inflation to itself as well as response other variables in the system. The coefficient of exchange rate is significant to explain the inflation with negative relationship. The increase in exchange rate means depreciation of Myanmar kyats force to increase inflation. Moreover, in the next segment show the response of real interest itself and other variables. Interest itself and inflation is significant to explain the interest rate of Myanmar and the lag value of interest and inflation is negatively related with interest rate.

Table 4 Impulse Response to one unit Shock in the VAR

lag	Dependent Variable	Explanatory Variables			
		RGDPGR	RER	INF	RIR
1	RGDPGR	-0.4025*	0.0000	-0.0487*	0.0039*
2	RGDPGR	-0.273	0.0027	-0.0327*	0.0039*
3	RGDPGR	0.1304	0.0036*	0.0048	0.0026
1	RER	8.9546	-0.1702	-17.1601	0.1996
2	RER	51.469	-0.0478	8.273	-0.0510
3	RER	-0.3587	-0.6354	-7.5784	-0.2265
1	INF	-0.2264*	0.0228*	-0.0113	0.01455*

2	INF	1.3161*	-0.0018*	-0.0994	0.0035
3	INF	1.0181*	-0.0113*	-0.2879*	0.00526
1	RIR	-26.7310*	-.0093	-8.1509*	-0.3056*
2	RIR	8.5117	.0937	2.7851	-0.3408*
3	RIR	-6.4471	-.0442	-6.3864*	-0.17083

Note: * is significant at 5 % level

Figure 5 Impulse Response Function

Graphs by irfname, Impulse variable, and Response variable
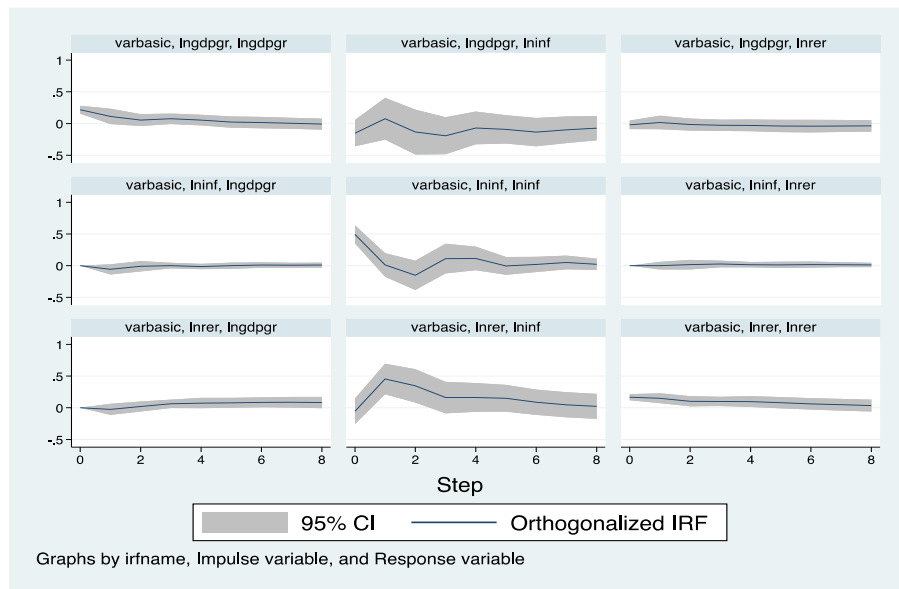
Figures 5 illustrate the impulse response functions of different variables, which are correlated with real exchange rate and growth rate of GDP and inflations rate of the country. As shown in figure, the one standard deviation shock of exchange rate has negative effect on the on economic growth rate of the country. And then, the shock of exchange rate on inflation is positive in should run period and start decrease in the long run.

6.1.2 Forecast Error Variance Decomposition

The variance decomposition shows the percentage of the error mad forecasting a variable over time due to a specific shock. This means that, how much of the variability in the dependent variable is explained by its own shocks verses shocks in the other variables in the system. It is also important to determine which of the two variables contributed more to the forecasting power of economic growth. This is done by analyzing the forecast error variance decomposition

(FEVD)estimates obtained from the Vector auto-regression as adapted from EDO (2009). The growth rate of Myanmar is more impact by variation in exchange rat than inflation variation in study period. The inflation of the country suffers by the shock from exchange rate and also its own lag variation The analysis so far establishes that exchange rate as well as inflation rate exerts an impact, but inflation rate influences a higher impact on economic growth rate in Myanmar Economy. It can be observed that the contributions of exchange rate are the smallest in value, which clearly indicates that exchange rate tends to enhance more the forecasting power of economic growth rate model by minimizing forecast errors.

Figure 6 Forecast Error Variance Decomposition
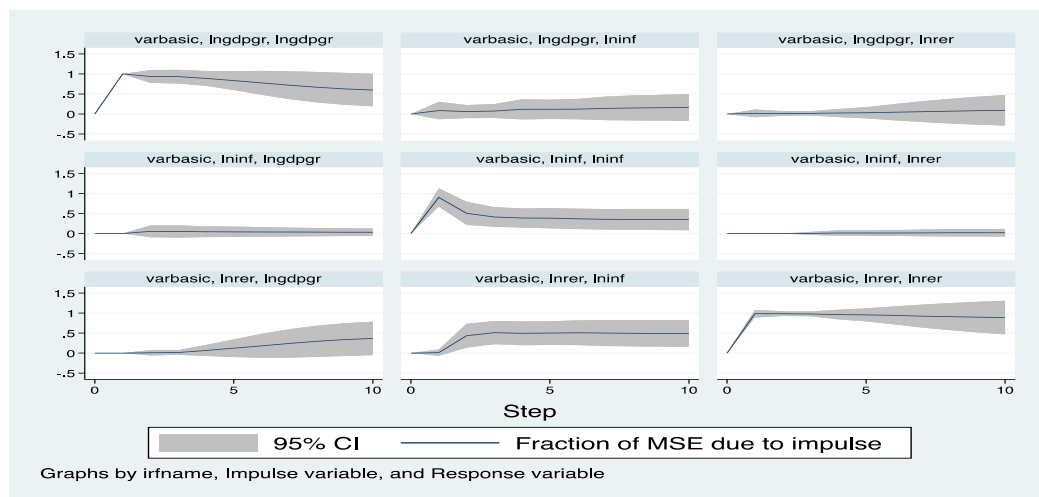
6.2. Empirical Analysis and Discussion of the Result of Model II(VECM)

To investigate the long-run relationship and short-run dynamic of the exchange rate and economic growth of the country employed the Vector Error Correction Model (VECM). According to the Table 5 result, all the variables in the Model I are stationary at first level and the next step of identifying the optimal lag level is require for approaching the VECM. To determine the optimal lag selection Akaike information criterion (AIC) is used for decision criteria in this study. By applying the AIC criteria and most of the other criteria result suggest that the lag length of 2 is the optimal lag level to regress this system analysis.

Table 5 Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) Test for Unit root for Model II

Model	Variables	At Level				At First Difference			
		ADF Test statistics	Critical value at 5%	Critical value at 10%	p-value	ADF Test statistics	Critical value at 5%	Critical value at 10%	p-value
ADF	lnNGDP	1.013	2.983	2.623	0.748	3.289	2.986	2.624	0.015
	lnMER	2.465	2.983	2.623	0.124	4.016	2.986	2.624	0.001
	lnFER	1.678	2.983	2.623	0.442	4.828	2.986	2.624	0.000
	lnEX	1.971	2.983	2.623	0.299	4.741	2.989	2.624	0.000
	lnIM	1.252	2.983	2.623	0.651	5.716	2.986	2.624	0.000
	lnFDI	3.265	2.986	2.624	0.016	8.669	2.989	2.625	0.000
PP	lnNGDP	0.938	2.983	2.623	0.775	3.197	2.986	2.624	0.020
	lnMER	2.566	2.983	2.623	0.100	3.892	2.986	2.624	0.002
	lnFER	1.661	2.983	2.623	0.451	4.871	2.986	2.624	0.000
	lnEX	2.238	2.983	2.623	0.192	4.691	2.986	2.624	0.000
	lnIM	1.274	2.983	2.623	0.641	5.700	2.989	2.624	0.000
	lnFDI	3.177	2.986	2.624	0.021	10.260	2.989	2.625	0.000

Note: Estimated results are reported at absolute value

The next step is the test for cointegration. According to the optimal lag critiea of AIC the best choice for lag for this analysis system is two. Lag length selection for the system approach really matters the number and stationary of cointegration vectors. After identifying the optimal lag level, to investigate the long run relationship and short run dynamic of the cointegrated series, the Johansen tests for cointegration method is used for analyzing how the variable in the system is cointegrated.

Table 3.6 Trace Test and Maximum Eigenvalue test for the Cointegration Rank

Maximum Rank of CEs	*Trace Test*			*Maximum Eigenvalue Test*		
	Eigenvalue	Trace Statistics	Critical Value 5%	Eigenvalue	Maximum	Critical Value 5%
0	0	90.1930	68.52		39.4826	33.46
1	0.74372	50.7104	47.21	0.74372	22.1828	27.07
2	0.53463	28.5276*	29.68	0.53463	15.4093	20.97
3	0.41219	13.1183	15.41	0.41219	9.4808	14.07
4	0.27886	3.6375	3.76	0.27886	3.6375	3.76
5	0.11788			0.11788		

Note: * is the selected rank

According to the result of trace test statistics and maximum eigenvalue of the cointegration rank, there are two cointegrating vectors in the system. Both trace test and maximum eigenvalue proved two cointegrating vectors in the system. Therefore, the variables in the system have both long run relationship and short run dynamic.

6.2.1 Long-Run Structure of the Analysis

In the VECM model Johansen normalization restriction imposed the long-run cointegration of the system analysis. According to the tested result the long-run relationship of exchange rate policy and economic growht of Myanmar and other variable can be expressed as follos:

$$\Delta lnRGDP = 81.5154 - 6.3653\ \Delta lnRER - 5.1983\ \Delta lnFXR + 6.7769\ \Delta lnEX - 4.8744\ \Delta lnIM +$$
$$1.6353\ \Delta lnFDI + 0.97507\ D \tag{11}$$

Equation (11) represents the long run relationship betweenthe real exchange rate and economic growth and the other economic indicators. In Myanmar Economy,the exchange rate and the foreign exchanger exchange reserve have a negative relation. On the other hand, the export and foreign direct invest boost the economic growth of the country. Moreover, D is represent for the exchange rate policy reforms of Myanmar after 2012 under the transformation democratic

government ear. The result of the coefficient of the dummy policy variable represent the exchange rate policy reforms have the positive effect on the economy. All the coffeicient of variables in the system are significant at 1 percent level interval. Therefore, the relationship between the independent variables can strongly explain the real GDP growth of the country

The error correcting terms of the cointegrating equation of the long-run model is as follow:

$$ECT_{t-1} = [\ 1.000\ lnRGDP_{t-1} + 6.3653\ lnRER_{t-1} + 5.1983\ lnFXR_{t-1} - 6.7769\ lnEX_{t-1} + 4.8744$$
$$lnIM_{t-1} - 1.6353\ lnFDI_{t-1} - 0.97507\ D] \qquad\qquad (12)$$

6.2.2 Short-Run Structure of the Analysis

The short-run model of the relationship between the real exchange rate and economic growth can be extract from the analysis of the VECM system model:

$$\Delta lnRGDP = 0.0325 + 0.5106\ \Delta lnRGDP_{t-1} + 0.0014\ \Delta lnRER_{t-1} + 0.0385\ \Delta lnFXR_{t-1} - 0.0521$$
$$\Delta lnEX_{t-1} + 0.074\ \Delta lnIM_{t-1} - 0.0194\ \Delta lnFDI_{t-1} + 0.0112\ D - 0.0137 ECT_{t-1} \qquad (13)$$

$$\Delta lnRER = 0.1681 - 1.5936\ \Delta lnRGDP_{t-1} - .19404\ \Delta lnRER_{t-1} - 0.3108\ \Delta lnFXR_{t-1} - 0.0820\ \Delta lnEX$$
$$_{t-1} - 0.36507\ \Delta lnIM_{t-1} + 0.1309\ \Delta lnFDI_{t-1} .1364\ D\ -.03478\ ECT_{t-1} \qquad (14)$$

Form the VECM model system, only two equation of real GDP growth and real exchange rate express in this section to emphasize the relationship between those two variables. According to the estimation result, in the short run, the real exchange rate can have a positive effect on real GDP, but the coefficient of the RER is not significant in the short run. In short-run import, FDI and lag value of GDP only can explain the GDP of the country. In equation 13 and 14, only error correcting terms of equation 13 is significant. It means that, in equation 13, the adjustment term (ECT coefficient) is statistically significant at the 5 percent level and, suggesting that previous year's errors (or deviation for long run equilibrium) are corrected for withing the current year at a convergence speed of 1.4%. On the other words, the error correction terms in equation is significant and has negative value. It means, there is long tern causality running from the real exchange rate , foreign exchange result, export , import, FDI and policy reform to GDP of the country.

7. Summary

This article attempts to investigate the long-run relationship and short-run dynamic of the exchange rate and economic growth of the country, Myanmar, over the period of 1988 to 2019. The period of study fragments into two noticeable distinctions of government era- under the military government era and democratic government era. The study reviewed the exchange rate policy reforms of Myanmar in this different government ear and examine the impact of these policy reforms on the economic growth of the country. The management of the exchange rate is one of the major policy objectives in Myanmar to achieve a set of diverse objectives of economic growth, containment of inflation, and maintenance of external competitiveness. In Myanmar, under the military government, before 2012, most of the sectors are centralize by the government and the Central Bank of Myanmar (CBM) have no autonomy to conduct the monetary policy. Regulated various administrative controls on foreign trade and foreign exchange rate system have been one of the major obstacles in enhancing the substantial economic growth and the country faces tremendous economic deterioration which stuck the country's economy over the decades of the year. After 2012, the new democratic government took over the authority and conducted numerous policy reforms in various fundamental sectors of the country. Among these policy reforms, the most significant economic policy adopted by the new government was the overvalued official fixed exchange rate in effect since 1977 moved to a managed float in April 2012 which is known as the exchange rate unification system. According to these reforms, the economy of the country started to convalesce. Therefore, this study retrospects the policy reforms and investigates the significant impact of these reforms on growth. To fulfill the main purpose of the study and to explore the relationship between the targeted variables this study employed the cointegrated VAR (CVAR) and vector autoregression (VAR) technique. To specify the effect of policy reforms on the democratic era, in this study the author creates a dummy variable for analyzing the policy effects. The result indicated that in the long run there is a positive association between the real exchange rate and economic growth and inflation has a negative pressure on growth. Therefore, the exchange rate policy reforms in 2012 were pivotal in considering as a development strategy of the country, but the plausible of increasing inflationary pressure needs to be taken into account while adopting this policy option. This study finds that in the long run, the real exchange rate has a positive impact while inflation debilitates the real GDP growth rate of Myanmar. However, the real exchange rate

has no short-term dynamic impact on the real GDP growth of Myanmar. In addition, the 2011 CBM policy reform of the exchange rate do have significant impact on the country's growth rate. Therefore, the policy reforms provide the positive effect in the leading of sustainable growth with price stability. The conclusion from this study shows that the liberalization and unification of the exchange rate policy reforms were gainful to Myanmar's economy as they promote the steady growth of the economy. However, Myanmar as a developing country, although this exchange rate policy has an expansionary effect on economic growth, it still needed to review and reforms other sector which can accelerate the economic growth of the country.

Chapter III
The Impact of Exchange Rate on Trade Balance of Myanmar

1. Introduction

1.1. Principle and Rationale Backgrounds

The exchange rate is one of the critical indicators of the country because it has a powerful influence on a country's activity of foreign trade development. Therefore, it is no need to be doubtful that the changing of the exchange rate will have a permanent effect on trade balance. In the globalized world, international trade becomes more important in every economy. There are various problems that all the multinational enterprises must face. The economy can be affected by the changes in exchange rate, either positively or negatively.

When considering the changing of exchange rate, it can be divided into two conditions: one is currency depreciation and another one is currency appreciation. Currency depreciation may have enormous impacts on the trade balance but the impact may alter, perhaps due to disparate level of the country's economic development. One of the conspicuous impacts describes that real depreciation increases the trade balance in the long run. Depreciation may improve the trade balance in to two different ways of channels.

Firstly, the quantity of export will increase. In the case of currency depreciation of the currency, the price of domestic goods is cheaper than foreign goods when comparing these two prices. Therefore, the country's export becomes more competitive. Secondly, on the other hand, the quantity of imports will decrease, because when comparing domestic and foreign price, the import for the country is more expensive as a result of currency depreciation. But, the export and import may not be reactive at the beginning period of the depreciation. Therefore, in the short run the value of export is decreased and the trade balance may deteriorate. After some period time, in the long run, it may be improved.

In Myanmar, the multiple exchange rate regimes which involved the official exchange rate that operated in public sectors and the market exchange rate that operated in private sectors trade of the country was activate for a long time. At that time, in the country there has been an enormous use of informal exchange rate by the private sector agent produced various kinds of distortions in the country in several years over decades.

To solve that problem, Myanmar government reformed the unification of that multiple exchange to benefit from more effective and productive allocation of resources. Until 2012 Myanmar adopted the fixed exchange rate system with official rate 6 Kyats per Dollar, and after 2012 the government derestricted the financial system and adopted the manage floating exchange rate system. After this the Myanmar currency depreciated over time. There is the reason why the author wants to study on the different impacts between appreciation and depreciation on the trade balance.

By geographical area, Myanmar is one of the largest countries in Southeast Asia of about 50 million people. Although the country endowed rich natural resources, it suffered from decades of weak economic performance activities and worsening socioeconomic conditions. The economy faced persistent economic problems such as low growth rate, high rate of inflation, limited international transactions, and poor investment climate. Among those weak economic policies of Myanmar, the exchange rate regime with multiple exchange-rate regimes which consist of the official exchange rate and informal market exchange rates can be seen as a key example.

The military government of Myanmar, from 1988 to 2011, regulated various administrative controls on foreign trade and foreign exchange rate system, which forced to peculiarly appear dual exchange rate regime: an official exchange rate in the public sector like SEEs and an unofficial market exchange rate in the private sector of the country. In 1977, the official exchange rate was fixed at 8.50847 kyat per special drawing right (SDR) of the International Monetary Fund (IMF) and thus had been fixed for more than 30 years (Kubo, 2012). In contrast, the parallel market rate has depreciated inveterately in the past as a result of unstable and poor macroeconomic performance.

In 2006, the market exchange rate which was conducted in public sector agents has appreciated sharply against the US dollar. In nominal terms, the exchange rate of the kyat per US dollar appreciated to 850 kyat in 2011; that is a serious difference from official rate of 5.39 at that year. So it can be seen that the informal market exchange rate is more than over 140 times when compared with the official exchange rate. According to Gelb (1988), who analyzed the impact of oil price shocks on six oil-exporting developing countries, the most severe real appreciation between 1973 and 1984 was in Nigeria; the appreciation of that country of over 11 years was 187 %. When making the comparison of that country, the results show that the official exchange rate appreciation experienced in Myanmar has been inordinately high. Most of the empirical

studies on exchange rates have expressed that inappropriate and unstable exchange rates deteriorate growth in trade balance.

The official pegging of the Myanmar kyat to the special drawing right of the International Monetary Fund was abrogated in April 2012. Under the reformed of new government at that year, the Central Bank of Myanmar (CBM) constituted a managed floating exchange system incorporate by daily foreign exchange auctions with authorized dealer banks. At the end of March 2012, the official exchange rate was devalued from 5.56 kyat per U.S dollar to 818 kyat per dollar as a result of unification of exchange rate by CBM. Aside from that, other government policy reforms involved an extraction of the export first and import second policy and the conversion of foreign exchange certificates. In Myanmar, the pre-reform foreign exchange system had two distinctive features that exercised unfavorable effects on the economy.

The first feature was administrative controls on the foreign exchange rate and therefore the trade sector separated the foreign exchange market into the public and private sector. Different exchange rates were activated in different separated sectors, and these conditions lead to inefficient allocation of resources the economy. The other feature of the pre-reform condition was no formal institution for exporters and importers to convert currencies in the private sector. That condition led these two groups to interact in a parallel market, where exchange rates expose high volatility. It means the black market was arisen in that decade to convert currencies with depreciate exchange rate than official exchange rate.

Myanmar has had no appropriate monetary policy framework because it lacks the necessary instruments and institutions. According to the suggestion from IMF, the Central Bank of Myanmar (CBM) was created the process of an interbank money market. More essentially, the CBM prevail as a department within the Ministry of Finance and Revenue and deficiency the operational autonomy necessary to manage monetary policy in a modern market economy. The new government, Thein Sein, received advice from the IMF on the implementation of a new Central Bank Law. Three essential functions of the CBM will launch (1) an efficient payment system, (2) effectively supervise and regulate the banking system, and (3) manage the country's foreign exchange reserves.

An appropriate foreign exchange rate regime is essential for trade and investment. In Myanmar, the decades-long multiple exchange rate was finally unified in April 2012. In that year, April 2012, the exchange rate unification conducted by the Central Bank of Myanmar (CBM)

operated an "auction" each morning among 17 of Myanmar's banks to determine the reference rate for the Myanmar kyat (MMK) against the US dollar. Once set, other banks and money changers are allowed to exchange the kyat within a band of increase or decrease 0.8 percent above or below the reference rate. Consistent with the rationale of a managed float, the CBM maintains that it will not intervene in the foreign exchange market to achieve any particular rate, but only when it perceives the market for the kyat has become disorderly or divorced from (unspecified) fundamentals.

The most significant economic policy adopted by the new government was the overvalued official exchange rate in effect since 1977 moved to a managed float on April, 2012. In the performance of the reform period, the IMF supported crucial technical advice in implementation of this movement, which was preceded in 2011 by giving license to seventeen private banks to open "money changer counters" for retail transactions.

When overviewing the exchange rate history of Myanmar, it can be seen the exchange rate of Myanmar face mostly depreciated. According to the theory, the country which depreciation in exchange rate may improve the country's trade balance. The exchange rate and trade balance of Myanmar can be shown by the figure as follows.

Figure 1 Exports and Imports Value in US$ million, 2001 to 2015
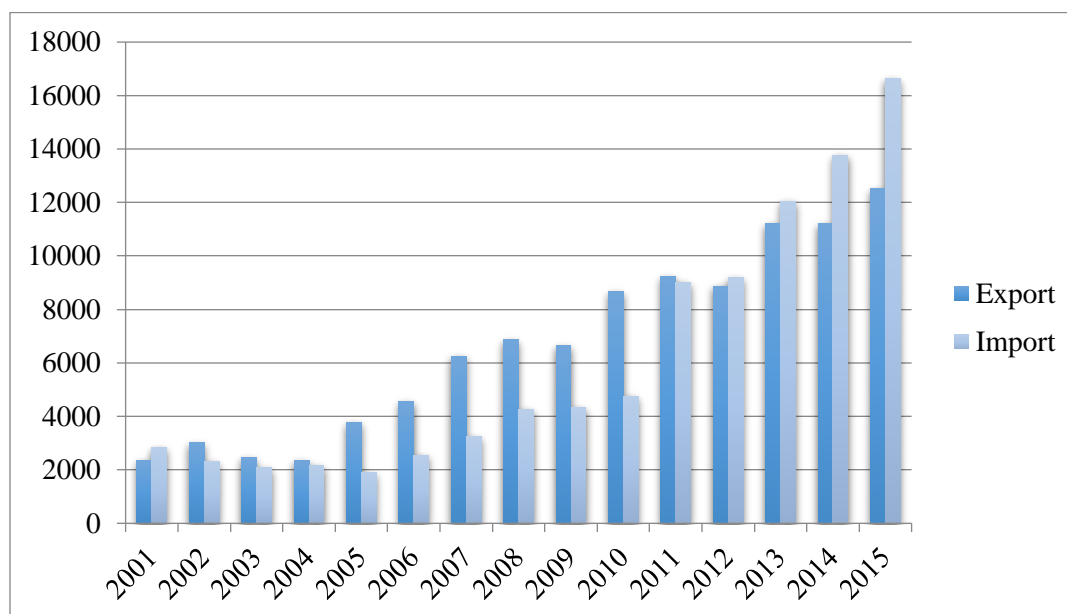
Source: Central Statistical Organization (CSO) Myanmar, * World Trade Organization, .* million in US, dollar, **Kyat per US dollar

Figure 1 shows the volume of export and imports from 2000-2001 to 2013-2014. Before 2012, export was higher than import, and after 2012, import was higher than export. After 2012, import was significantly greater than export when compared with previous years.

Figure 2 show the trade balance and exchange rate of Myanmar. Starting from 2012, when the exchange rate increased, the trade balance decline dramatically.

Figure 2 Comparing the official and market exchange rate and Trade Balance 2001 to 2015
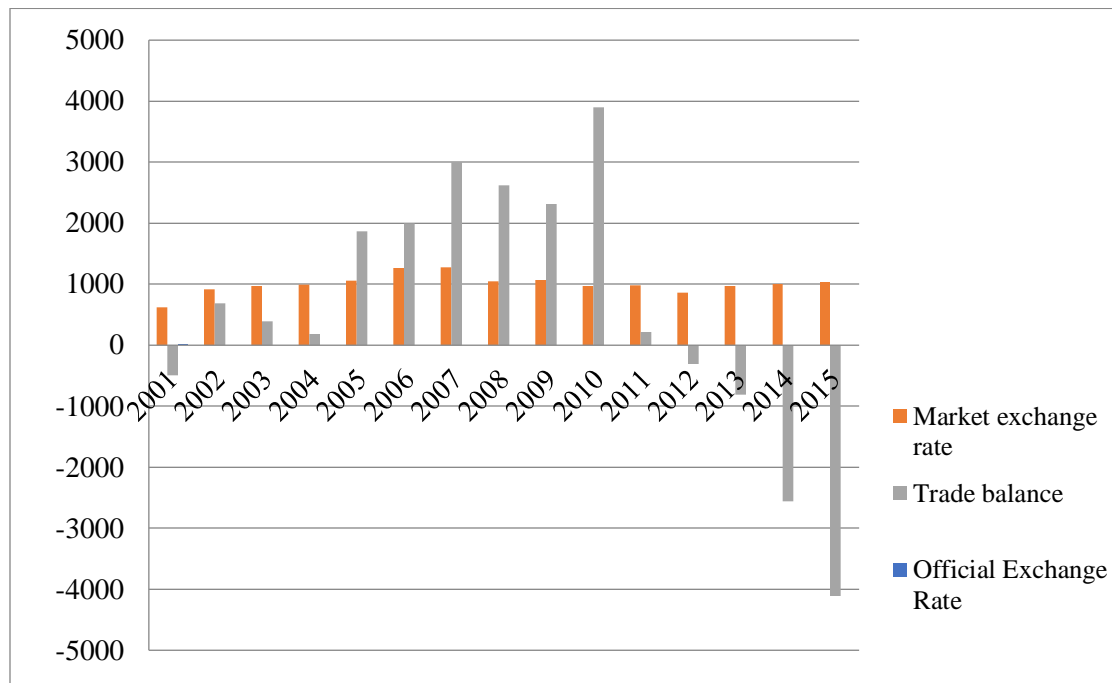
Source: Central Statistical Organization (CSO) Myanmar, * World Trade Organization, .* million in US, dollar, **Kyat per US dollar

In the early time, the official exchange rate of Myanmar has been only about between 5 Kyats and 7 Kyats per dollar. After 2012, the new government of Myanmar adopted manages floating exchange rate system. Therefore the exchange rate become consistent rate compared with the market rate. This research aims to study how the real exchange rate effects trade balance (how the currency appreciation and depreciation will affect the trade balance) of Myanmar. There are many studies which analyze the long run relationship and short run relationship between real exchange balance and trade balance. But there were no studies which examined the effect of currency appreciation and depreciation on the trade balance of the country by using Switching Regression Model. Therefore, this study tried to find out the effect of exchange rate on trade balance by using

Switching Regression Model, and can also provide the sustainable economy of Myanmar by conducting the appropriate exchange rate regime policy.

The purpose of this study is to analyze the impact of exchange rate on trade balance in Myanmar. The main objectives of this paper is

- to study the different impacts between appreciation and depreciation on the trade balance before and after reform exchange rate policy in Myanmar.

The study will investigate:

- whether the depreciation of exchange rate has a favorable impact on trade balance or not in Myanmar.
- how exchange rate effects on Myanmar trade balance and
- how the country experienced fixed and managed float exchange rates

This studies the period of 1986-2015 of the annual reports of Myanmar. Most of the data used in this research are secondary data. The variables used in this research are trade balance, exports, imports, and exchange rate such as official exchange rate and market exchange rate. Based on the accessibility of data and regarding the methodology section, yearly data from 1986 to 2015 was collected. In order to increase robustness of the study, data was collected from International Monetary Fund (IMF), World Trade Organization (WTO), and Central Statistical Organization (CSO), Myanmar.

2. Theory and Literature Review
2.1 Theory

In this chapter, some of the related theories concerning this study will be discussed in two ways as economic theory and econometric theory.

2.1.1. Economic Theory

Economic theories to be emphasized concerning the influence of exchange rate on trade balance are (1) elasticity approach; and (2) balance of payment approach. When studying about the exchange rate, there are two basic kinds of exchange rate which are nominal and real exchange rate. Nominal exchange rate is the relative price of the currencies of two countries (MANKIW,

2013). This means that the country can trade at the rate at which the currency unit of one country to another. Real exchange rate is the relative price of the goods of two countries. That is, the real exchange rate shows the rate at which it can trade the goods of one country for the goods of another (MANKIW, 2013).

(i) The Exchange Rate and the Trade Balance

The real exchange rate is the price of domestic goods relative to foreign goods. An appreciation of the exchange rate may tend to decrease trade balance or net exports which are export minus import. The nominal exchange rate is determined by the real exchange rate and the price levels in the two countries. Suppose that the real exchange rate is low. It means domestic currency is depreciating. Therefore, the domestic goods are cheaper than foreign goods, and the domestic residents will want to buy fewer imported goods than domestic produce goods. On the other hand, foreigners will want to purchase many of domestic produce goods as a result of both of these actions. The quantities of exports are greater than the quantity imports, so the trade balance of the country will be improved.

In contrast, if the real exchange rate is high, it means domestic currency is appreciating. Therefore the domestic goods are more expensive relative to the foreign goods, and the domestic residents will want to purchase many imported goods. On the other hand, foreigners will want to purchase few domestic goods. Therefore, the quantity of the country net exports will be low because of quantity exports less than the quantity of import, so the trade balance of the country will be reduced. The relationship of the exchange rate and trade balance can be illustrated by the graph as follow:

Figure 3 Net Exports and the Real Exchange Rate
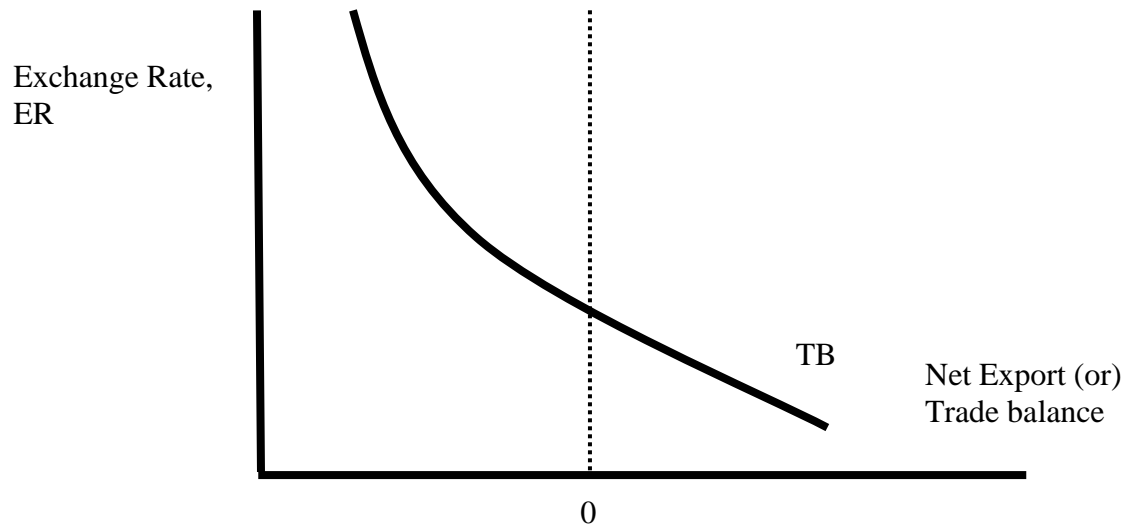
Figure 3 illustrates the negative relationship between the trade balance and the real exchange rate. The lower the exchange rate, the domestic produce goods are less expensive relative to foreign imports, and therefore the greater are the country trade balance. In the figure, the horizontal axis measures negative values of net export because imports can be greater than exports Therefore net exports can be lower than zero. The exchange rate is related to the trade balance negatively. The impact of exchange rate on trade balance can be seen as two different kinds of approaches. There are the elasticity approaches and the balance of payment approach explained as follows.

(ii) The Elasticity Approach

In the approach of elasticity, it emphasizes on the relative's price effects of depreciation on trade balance and it proposes that depreciation works best when the elasticities of demand are high. In this approach, the country's currency depreciation affects a country's trade balance through changes in the relative prices of goods and services internationally. When a country which trade balance faces deficit, it can be able to interchange its trade deficit by reducing its relative prices so that the country's exports may be high and imports may be low. The nation can reduce its relative prices by authorizing its exchange rate to depreciate in a free market or by devaluing

its currency under fixed exchange rates system. The final result of currency depreciation may depend upon the price elasticity of demand for its exports.

(iii) The Balance of Payments (BOP) Approach

In the approach of the balance of payments, that explains what kinds of factors influence the supply and demand of a nation's currency. The balance of payments is a method of recording all the international monetary transactions of a country during a specific period of time (MANKIW, 2013). The recorded transactions are separated into three kinds of categories: the current account transactions, the capital account transactions, and the central bank transactions.

As stated earlier, a nation's price of currency depreciation or appreciation instantly affects the volume of a nation's imports and exports and, consequently, a fluctuation in the exchange rates can affect the balance of payment variances. A country's currency depreciation will improve the value of exports in domestic currency terms, and conversely, the imports will become more expensive. Its value will be decrease domestically. If the value of exports increases greater than the value of imports, the currency depreciation will be better than the current account.

2.1.2. Econometric Theory

Theoretical model was used to find out the impact of exchange rate on trade balance in Myanmar can be specified as a simple model:

$$GTB = f (GMER, GEX, GIM) \qquad (1)$$

where, GTB stands for growth rate of trade balance. MER stands for the growth rate of market exchange rate, GEX stands for growth rate of export, and GIM stands for the growth rate of import. This model sets a hypothesis that TB is a function of market exchange rate, trade balance, export and import. In order to analyze and examine the degree of influence of exchange rate on trade balance, Augmented Dickey Fuller (ADF) unit root test, which is a set of methods of time series econometrics, was used to analysis the data or stationary or not. Switching Regression Estimation wass used in this study.

(i) Test the Unit Root Test

To test a Unit root is believed to be the first step in a study. This step will be to test different economic variables that will be used in the equations to determine if they are stationary or non-

stationary. The equation is to be Stationary [I (0) integrated of order 0;], or Non-stationary [I (d), d > 0; integrated of order d]. Most studies are popular for testing Unit root by Dickey-Fuller test (DF) and the Augmented Dickey-Fuller test (ADF). By the DF test method, these are H$_0$: $\rho = 1$ from the equation (2) below.

$$X_t = \rho X_{t-1} + \varepsilon_t \tag{2}$$

where, X_t is the independent variable of time series data at time t.

$\quad$ X_{t-1} is the independent variable of time series data at the time t-1 .

$\quad$ ε_t is random error.

$\quad$ ρ is the relative rate coefficient (Coefficienct Autocorrelation). .

If ρ = 1, we can write as follow:

$$X_t = \rho X_{t-1} + \varepsilon_t \; ; \varepsilon_t \sim \text{i i d} \, (0, \sigma^2 \varepsilon_t \, .) \tag{3}$$

where ε_t is a series of random variables, where the normal distribution is the same and is independent of each other, with the average value of zero and a constant variance , with the assumption of the test of Dickey-Fuller.

$\quad$ H$_0$: $\rho = 1$

$\quad$ H$_a$: $|\rho| < 1$; $-1 < \rho < 1$

$\quad$ The test, called a unit root. If H$_a$: $|\rho| < 1$, X_t is a stationary. And if : H$_0$: $\rho = 1$ X_t is nonstationary. However, this test can be performed as

$$\Delta X_t = \theta X_{t-1} + \varepsilon_t \tag{4}$$

That is, $X_t = (1 + \theta) X_{t-1} + \varepsilon_t$, which is the equation (2.3) exerted by the $\rho \, (1 + \theta)$:

$\quad$ H$_0$: $\theta = 0$

$\quad$ H$_a$: $|\rho| < 1$; $-1 < \rho < 1$

If θ in the equation (2.4), the negative is thatρ. Equation (2.3) shall be less than 1, therefore it can be concluded that the rejection H$_0$: $\theta = 0$, which is the accepted : H$_0$: $\theta < 0$, means that the $\rho < 1$ and X_t are integration of order zero. That is, X_t looks stationary and if we are not able to.

Reject: H₀: $\theta = 0$ it means that X_t is still nonstationary. If X_t is the random walk complex which will have a general bias (random walk with drift) we can write the model as follows:

$$\Delta X_t = \alpha + \theta\, X_{t-1} + \varepsilon_t \tag{5}$$

And if X_t is the random walk complex, which has a general bias (random walk with drift) and likely based on linear (linear time trend), we can write the model as follows:

$$\Delta X_t = \alpha + \beta_t + \theta\, X_{t-1} + \varepsilon_t \tag{6}$$

Where t = time, that will do a test H₀ : $\theta = 0$, with : H₀ : $\theta < 0$ summary. Dickey and Fuller regression equations were considered three different models to test whether there is a unit root. Whether or not that three such equations are:

$$\Delta X_t = \theta\, X_{t-1} + \varepsilon_t \tag{7}$$

$$\Delta X_t = \alpha + \theta\, X_{t-1} + \varepsilon_t \tag{8}$$

$$\Delta X_t = \alpha + \beta_t + \theta\, X_{t-1} + \varepsilon_t \tag{9}$$

The parameters θ are interested in all the equation. That is, if $\theta = 0$; X_t is unit root by comparing statistics t (t-statistic), calculated with the appropriate values that are in the table of Dickey-Fuller or to the critical value of MacKinnon. However, the critical value will not change. If the equation (7), (8) (9), to be replaced by linear regression rate (autoregressive processes).

$$\Delta X_t = \theta\, X_{t-1} + \sum_{i=1}^{\rho} \emptyset_i\, \Delta X_{t-i} + \varepsilon_t \tag{10}$$

$$\Delta X_t = \alpha + \theta\, X_{t-1} + \sum_{i=1}^{\rho} \emptyset_i\, \Delta X_{t-i} + \varepsilon_t \tag{11}$$

$$\Delta X_t = \alpha + \beta_t + \theta\, X_{t-1} + \sum_{i=1}^{\rho} \emptyset_i\, \Delta X_{t-i} + \varepsilon_t \tag{12}$$

The number of lagged difference terms that will be imported is included in the equation; it must have enough. Positive values make the error terms are serially independent and take ADF (augmented Dickey-Fuller test) test statistic values for ADF test statistic with distribution. . Linear directed (the asymptotic distribution) is the same as the DF statistic, so that they can take up the critical values.

(ii) Switching Regression Model

Switching regression model is a model that consists of two scenarios, hypothetically. In both scenarios, as follows:

$$\text{Scenario} \quad 1: Y_{1i} = \beta_1 X_{1i} + u_{1i}, if \ \gamma' z_i \geq u_i \tag{13}$$

$$\text{Scenario} \quad 2: Y_{2i} = \beta_2 X_{2i} + u_{1i}, if \ \gamma' z_i < u_i \tag{14}$$

$$u_i \sim (0, \sigma_i^2), u_{1i} \sim (0, \sigma_{1i}^2)), u_{2i} \sim (0, \sigma_{2i}^2)$$

where, Y_{1i} is is a variable based on the time series data at the situation 1.

Y_{2i} is a variant based on the time series data at the situation 2

X_{1i} is the independent variable of time series data at the situation 1

X_{2i} is the independent variable of time series data at the situation 2

β_1, β_2, γ is the parameter value.

u_i, u_{1i}, and u_{2i} are the value of the variable error is random.

The assumption is that the u_i has a relationship with u_{1i} and u_{2i}; this model is called the Switching regression models. Regression model with endogenous Switching is defined by switching to a group within the structure of the models. From equation (13), if $\gamma' z_i \geq u_i$ and to select the equation (14), if $\gamma' z_i < u_i$, that is, to select the equation (14), If not $\gamma' z_i \geq u_i$, we see whether we will choose (13) and it will see that in this case is to decide whether to follow the equation (13) or equation (14). There have two choices or a decision that is two ways choose by containing a description explanatory variable). For decision, it already mentioned z_i is consistent; this style is called the Probit model. Define the Dummy variable which is the value of γ exerted, to perform a criterion function exerted thus:

$$I_i = 1 \ if \ \gamma' z_i \geq u_i,$$

$$I_i = 0 \quad \text{Otherwise}$$

In the case of a clear example of discrimination, it can define what I_i will have a value of 1 or 0. So can use it as a maximum the Probit maximum likelihood to find γ by I_i is a variable (the Dependent variable) and γ can be estimated, in such a way that a Scale factor only. Let Var $(u_i) = 1$ also assumes hypothetical, that u_i, u_{1i}, and u_{2i} have a normal distribution three Variant (normal Trivariate distribution) by the mean vector is equal to zero, and Covariance matrix.

$$\Sigma = \begin{pmatrix} \sigma_1^2 & \sigma_{12} & \sigma_{1u} \\ \sigma_{12} & \sigma_2^2 & \sigma_{2u} \\ \sigma_{1u} & \sigma_{2u} & 1 \end{pmatrix} \tag{15}$$

Function is supposed to be the likelihood function for the the probit model this can be written as follows:

$$L(\beta_1, \beta_2, \sigma_{1u}, \sigma_{2u}) = \pi \left[\int_{-\infty}^{\gamma'z_i} g\left(Y_i \; \beta'_1 X_{1i}, u_i\right) du_i \right]^{I_i} \left[\int_{\gamma'z_i}^{-\infty} g\left(Y_i \; \beta'_1 X_{1i}, u_i\right) du_i \right]^{I_i} \qquad (16)$$

By g and f, a function of two variables is normal density functions of the normal distribution with two variables (u_{1i}, u_i), and (u_{2i}, u_i), respectively, and will see that σ_{12} does not appear In the equation (16). Therefore σ_{12} value cannot be estimated only σ_{1u} and σ_{2u}. The function equation (13) can be found by using the regression method, switching to 2 steps (Two-Stage Switching Regression Method) to adjust the value of tolerance, have an average of zero. Unable to find expected value of u_{1i} and u_{2i} in equation (13) and (14), which for the value of u_{1i} is shown as follows:

$$E(u_{1i}|u_i \; z_i \le \gamma'z_i) = E(\sigma_{1u} \; u_i|u_i \; z_i \le \gamma'z_i)$$

$$= -\sigma_{1u} \frac{\emptyset(\gamma'z_i)}{\phi(\gamma'z_i)} \qquad (17)$$

$$E(u_{2i}|u_i \; z_i \le \gamma'z_i) = E(\sigma_{2u} \; u_i|u_i \; z_i \le \gamma'z_i)$$

$$= -\sigma_{2u} \frac{\emptyset(\gamma'z_i)}{\phi(\gamma'z_i)} \qquad (18)$$

where the conditional distribution of u_{1i}, u_{2i} is normally, with the average equal to $\sigma_{1u} \; u_i$, $\sigma_{2u} \; u_i$ and the variance is equal to the $\sigma_1^2 - \sigma_{1u}^2$, $\sigma_2^2 - \sigma_{2u}^2$ by a u_i is defined, and the variance of u_i is equal to 1.Using the method of least squares to estimate the parameters of the equation (13) and (14). The value of these parameters is bias and not consistent. Proposed method of estimating the parameters of an equation (13) and (14), by adding the new variable W_{1i} and W_{2i} into equation (13) and (14), to eliminate the problem, which ways will have a new equation as follows:

$$Y_{1i} = \beta'_1 X_{1i} - \sigma_{1u} W_{1i} \; + \varepsilon_{1i} \; \text{For } I_i = 1 \qquad (19)$$
$$TB_{2i} = \beta'_2 RXR_{2i} - \sigma_{2u} W_{2i} \; + \varepsilon_{2i} \; \text{For } I_i = 0 \qquad (20)$$

where ε_{1i}, ε_{2i} is the new tolerance value that is the average conditional (Conditional Means) is zero.

$$\varepsilon_{1i} = u_{1i} + \sigma_{1u} W_{1i}$$
$$\varepsilon_{2i} = u_{2i} + \sigma_{2u} W_{2i}$$

This can be estimated from the value β_1 and β_2 of the equation (13) and (14). By first finding the value γ from the maximum focus on the way the probit maximum likelihood. By

observing I_i, which from the value $\gamma^{\wedge}$, it can calculate the value $\gamma' Z_i$ did that in the end, we can calculate W_{1i} and W_{2i}. The second step is to estimate the equation (19) and (20), by using Ordinary Least Squares method, this will give you an estimate of β_1, β_2, σ_{1u} and σ_{2u} and for finding the value of σ_1^2 and σ_2^2. Then, consider the variance of ε_{1i} and ε_{2i} from the equation (19) and (20) variance of it looks (Heteroscedastic) which, by principle, we should estimate the equation (19) and (20). The most common are less significant (Generalized Least Square, GLS) or the least squares method is a retard weight (weighted least squares) instead of the ordinary least squares method (OLS) and in the Var (ε_{1i}) and Var (ε_{2i}) is shown as follows:

$$E(u_{1i}\,|\,I_i = 1) = -\sigma_{1u} W_{1i}$$

$$E(u_{1i}^2\,|\,I_i = 1) = \sigma_1^2 - \sigma_{1u}\,(\gamma' Zi)W_{1i}$$

$$E(u_{2i}\,|\,I_i = 0) = -\sigma_{2u} W_{2i} \tag{21}$$

$$E(u_{2i}^2\,|\,I_i = 1) = \sigma_2^2 - \sigma_{2u}\,(\gamma' Zi)W_{2i}$$

$$E(u_{1i}\,|\,I_i = 1) = E(u_{2i}\,|\,I_i = 0)$$

$$Var(u_{1i}\,|\,I_i = 1) = \sigma_1^2 - \sigma_{1u}^2 W_{1i}\,(\gamma' Zi + W_{1i}) \tag{22}$$

$$Var(u_{1i}\,|\,I_i = 0) = \sigma_2^2 + \sigma_{2u}^2 W_{2i}\,(\gamma' Zi + W_{2i}) \tag{23}$$

How to find the value σ_1^2 and σ_2^2. This is the dirty lang from have the value β_1 and β_2 Then, we calculate the rest Residuals, as follows:

$$u^{\wedge}{}_{1i} = Y_i - \beta^{\wedge}{}_1 X_{1i} \text{ for } I_i = 1 \tag{24}$$

$$u^{\wedge}{}_{2i} = Y_i - \beta^{\wedge}{}_2 X_{2i} \text{ for } I_i = 0 \tag{25}$$

That from the equation (22) and (23) we can estimate the value σ_1^2 and σ_2^2 from

$$\sigma_1^{\wedge 2} = \frac{1}{N_1}\sum_{i=1}^{N_1}[\,u_{1i}^{\wedge 2} + \sigma_{1u}^{\wedge 2}\,(\gamma' Zi)\,W^{\wedge}{}_{1i} \tag{26}$$

$$\sigma_2^{\wedge 2} = \frac{1}{N_2}\sum_{i=1}^{N_2}[\,u_{2i}^{\wedge 2} + \sigma_{2u}^{\wedge 2}\,(\gamma' Zi)\,W^{\wedge}{}_{2i} \tag{27}$$

when N_1 = the number of observations in case $I_i = 1$.

N_2 = the number of observations in case $I_i = 0$.

In spite that according to theory and definitions, it can be seen from the formula in equation (26) and (27), a value of $\sigma_1^{\wedge 2}$ and $\sigma_2^{\wedge 2}$, there is always a positive value (then the variance will need to be the value is always positive). However, there is a choice of 2 to a value of about $\sigma_1^{\wedge 2}$ and $\sigma_2^{\wedge 2}$, by that method in this two ways, were up $\sigma_1^{\wedge 2}$ and $\sigma_2^{\wedge 2}$ is positive , that is completed for estimating the value of various parameters by means of two-stage switching regression models with Switching variable and to manage its constant variance of the value bias ε_{1i} and ε_{2i} in the equation (19) and

(20). The estimated parameter values to calculate the variance value in the equation (22) and (23) and use the method of least squares.

2.2 Literature Review

There are many empirical and descriptive studies on the impact of exchange rate on trade balance of the developing countries which found out various kinds of conclusions. PHAM THI TUYET TRINH (2012) examined the long and short run impact of Exchange Rate and Trade Balance in Vietnam: empirical examination on the impact of exchange rate on trade balance in short run and long run in Vietnam. The quarterly data of trade balance, real effective exchange rate, domestic output and foreign output (from 2000 to 2004) are used in this empirical study. The purpose of this study is to measure the short run and long run impact of exchange rate on trade balance. In this empirical study, the Autoregressive distributed lag (ADRL) model is analyzed to look into long run impact and error correction model (ECM) model based on long-run co-integration equation find out the short run impact respectively. The study confirmed that currency depreciation has significant effect on trade balance of Vietnam.

Ng Yuen-Ling (2006) analyzed the relationship between Real Exchange Rate and Trade Balance in Malaysia: this empirical study attempted to identify the relationship between real exchange rate and trade balance of the country. In this study, the Unit Roots, Engle-Granger test, Co-integration techniques, and Vector Error Correction Model are used. The annual data of real exchange rate, trade balance, domestic GDP and foreign (United State) GDP are analyzed in the study from 1995 to 2006. There are three main results found in this empirical study: there is the long run relationship existing between the trade balance and exchange rate, the real exchange rate is essential variable for trade balance, and the devaluation of the country currency can significantly improve the trade balance in the long run in Malaysia.

Dr. Keshab R.Bhattarai and Mark K. Armah (2005) investigated the effect of Exchange Rate on Trade Balance in Ghana: evidence from co-integration analysis. In this empirical study, it estimates the trade balance as a function of the real exchange rate, the domestic incomes, and the foreign incomes. In this study, the annual time series data from 1970 to 2000 are used to analyze the effects of exchange rate on the trade balance in Ghana. To analyze a stable relationship between trade balance and the real exchange rate in the long run, the VER- Error correction models are used to confirm. The result found out in this study is the Ghana's trade balance will not improve

in the short run but in the long run the devaluation of currency can improve the trade balance of Ghana.

Muhammad Shahbaz, Abdul Jalil and Faridul Islam (2006) explored the relationship between the Real Exchange Rate and the Trade Balance: the evidence from Pakistan. This empirical study analyzes the relationship between the exchange rate and the trade balance. The quarterly data of exchange rate and trade balance from July 1980 to June 2006 are used in this empirical study. The Auto Regressive Distributed Lag (ARDL) approach to co-integration model is used to examine the relationship of the variables. The three major findings of this research paper are (1) long run relationship between the real exchange rate and the trade balance for all periods used, (2) the currency depreciation leads to deterioration in the trade balance, and (3) the shock of the real exchange rate causes the deterioration response of the trade balance in Ghana. In the following tables, the major facts of the studies are summarized clearly.

3. Methodology

3.1. Conceptual Framework

From analyzing models which are relevant to the relationship between exchange rate and trade balance of the country, this paper studies the relationship by using Switching Regression model. Theoretical framework for the function of trade balance and exchange rate of Myanmar can be depicted as the following:

$$TB = f(MER, GEX, GIM) \tag{28}$$

The conceptual framework of the study is that the trade balance in the equation is the explained variable for the study and which may be affected by the fluctuation in exchange rate. The conceptual framework of the study can be illustrated by the following figure.

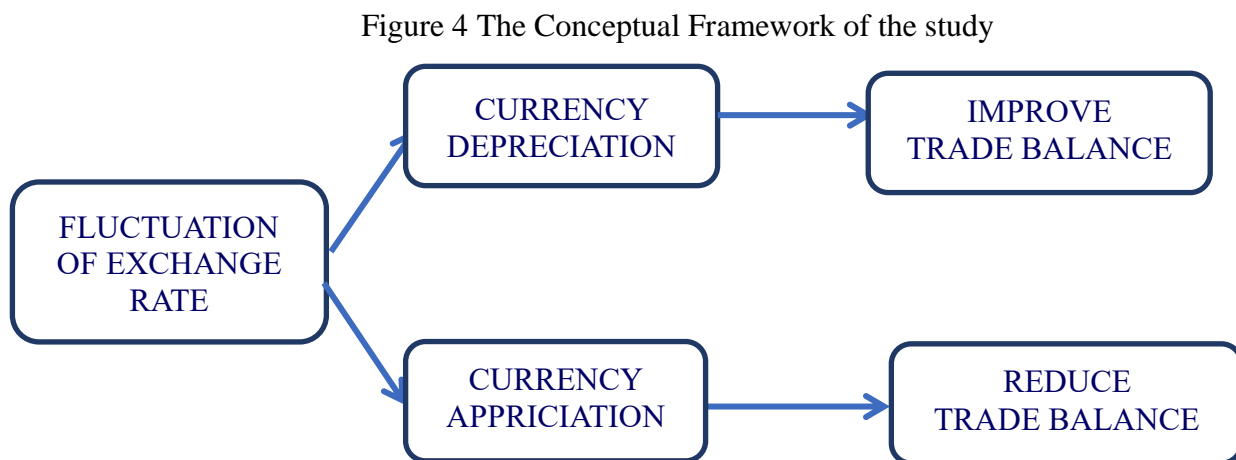Figure 4 The Conceptual Framework of the study

Figure 4 illustrates that the conceptual framework of the study. The trade balance in the figure is the regressand variable for the study and which may be affected by the fluctuation in exchange rate. Exchange rate of the country can be fluctuated as either depreciation or appreciation. These two fluctuations may have a different effect on trade balance of the country. If the country faces currency depreciation, which means that the domestic price of goods and services is cheaper than the price of foreign goods and services, therefore export is greater than import and the trade balance will improve. If in the case of currency depreciation, it may have the opposite effect on trade balance. The other variable GDP can also affect trade balance by two ways. GDP can also improve and worsen trade balance. If GDP increases, the country's national income increase, therefore the country may import more. If they import more capital goods, the country can improve the productivity and can enhance the export and the trade balance. But if the country imports consumption goods more the import will be greater than export and the trade balance will decline.

3.2. Variables Used in the Model

The variables that applied in this study are the Trade Balance, Export value, Import value, market exchange rate, and official exchange rate of Myanmar. The following table illustrates that the delineation of the variables and measurements used in this analysis.

Table 1 Summary Descriptions of the Variables

Variables	*Descriptions*
GTB	The Growth rate of Balance of Trade
GMER	The Growth rate of Market Exchange Rate
GEX	The Growth rate of Export Value
GIM	The Growth rate of Import Value

Source: world trade organization, IMF, Myanmar's Official Data Source

In this study the all variables are used into the form of growth rate as following:

GTB = Trade Balance in term of growth rate

GMER = Market exchange rate in term of growth rate

GEX = Export value in term of growth rate

GIM = Import value in term of growth rate

The growth rates of variables are can be calculated by using growth rate equation as follows:

$$Y = \frac{Y_t - Y_{t-1}}{Y_{t-1}} \times 100 \tag{29}$$

By using this growth rate equation , all the variables GTB, GEX, GIM, and GMER was calculate as follow:

$$GTB = \frac{TB_t - TB_{t-1}}{TB_{t-1}} \times 100 \tag{30}$$

$$GMER = \frac{MER_t - MER_{t-1}}{MER_{t-1}} \times 100 \tag{31}$$

$$GEX = \frac{EX_t - EX_{t-1}}{EX_{t-1}} \times 100 \tag{32}$$

$$GIM = \frac{IM_t - IM_{t-1}}{IM_{t-1}} \times 100 \tag{33}$$

3.3. Hypothesis of the Study

The cardinal purpose of this study is to analyze the important effects of exchange rate fluctuation on trade balance in Myanmar. According to this purpose, two hypotheses can be shown as follows:

Hypothesis 1: currency depreciation will improve trade balance of Myanmar over the period of 1986-2015.

Hypothesis 2: currency appreciation will reduce trade balance of Myanmar over the period of 1986-2015

3.4 Research Methodology

3.4.1 Test Unit Root Test (ADF Test)

The study needs to test unit root test first to know if the variables are stationary or nonstationary. Before doing Switching Regression estimation, it should be tested whether variables are stationary or not, because in order to analyze the impact of currency depreciation and

appreciation on trade balance, the data has to be stationary. If the test result is not stationary, the data needs to change to stationary by taking log. For testing this, ADF unit root test can be applied as the following:

Table 2 Hypothesis for Unit Root Test with Augmented Dickey-Fuller

Unit Root Test   ADF Unit Root Test

Null Hypothesis: H0	Time-Series is stationary.
Alternative Hypothesis: H1	Time-Series is non stationary.
Statistic test	t-Statistic
Prob. <0.1	0.00 – 0.10

Source: Author

$$\Delta GTB_t = \alpha + \beta_t + \theta\ GTB_{t-1} + \sum_{i=1}^{\rho} \emptyset_i\ \Delta GTB_{t-i} + \varepsilon_t \tag{34}$$

$$\Delta GMER_t = \alpha + \beta_t + \theta\ GMER_{t-1} + \sum_{i=1}^{\rho} \emptyset_i\ \Delta GMER_{t-i} + \varepsilon_t \tag{35}$$

$$\Delta GEX_t = \alpha + \beta_t + \theta\ GEX_{t-1} + \sum_{i=1}^{\rho} \emptyset_i\ \Delta GEX_{t-i} + \varepsilon_t \tag{36}$$

$$\Delta GIM_t = \alpha + \beta_t + \theta\ GIM_{t-1} + \sum_{i=1}^{\rho} \emptyset_i\ \Delta GIM_{t-i} + \varepsilon_t \tag{37}$$

If the variable is stationary and the probability value of the test is between 0 and 0.05 and the variable's test statistics are less than the critical value, and then the null hypothesis of the study can be rejected. If the variable is nonstationary, if the probability value of the test is greater than 0.05, and the variable's test statistics are greater than the critical value in absolute terms, then null hypothesis of the study cannot be rejected.

3.4.2. Estimation of Switching Regression Model

Switching regression model is a model that consists of two scenarios. Both scenarios are described as the following:

$$\text{Currency Appreciation 1: } GTB_{1i} = \beta_1 GMER_{1i} + u_{1i}, if\ \gamma'z_i \geq u_i \tag{38}$$

$$\text{Currency Depreciation 2: } GTB_{2i} = \beta_2 GMER_{2i} + u_{2i}, if\ \gamma'z_i < u_i \tag{39}$$

$u_i \sim (0, \sigma_i^2)$, $u_{1i} \sim (0, \sigma_{1i}^2)$, $u_{2i} \sim (0, \sigma_{2i}^2)$

where, GTB_{1i} is trade balance based on the time series data at the currency appreciation.

GTB_{2i} is trade balance based on the time series data at the currency depreciation.

$GMER_{1i}$ is the market exchange rate of time series data at the the currency appreciation.

$GMER_{2i}$ is the market exchange rate of time series data at the currency depreciation.

β_1 , β_2 , γ is the parameter value.

u_i , u_{1i} , and u_{2i} are the value of the variable error is random.

The assumption that the u_i has a relationship with u_{1i} and u_{2i}. This model is called the Switching regression models by switching to a group is defined within the structure of the models (regression model with endogenous Switching).

To perform a function Criterion function exerted thus define the variable dummy (Dummy variable):

$I_i = 1 \ if \ \gamma' z_i \geq u_i,$

$I_i = 0$ Otherwise

In the case of a clear example of discrimination, we can define what I_i will have a value of 1 or 0. Yet so we can use it as a maximum the Probit maximum likelihood to find γ by I_i is a variable (the Dependent variable) and γ can be estimated.

$$GTB_{1i} = \beta'_1 GMER_{1i} - \sigma_{1u} GIM_{1i} \ + \varphi_{1u} GEX_{1i} + \varepsilon_{1i} \ for \ I_i = 1 \tag{41}$$

$$GTB_{2i} = \beta'_2 GMER_{2i} - \sigma_{2u} GIM_{2i} \ + \varphi_{2u} GEX_{1i} + \varepsilon_{2i} \ for \ I_i = 0 \tag{42}$$

where ε_{1i}, ε_{2i} is the new tolerance value that is the average conditional (Conditional Means) is zero.

3.5 Descriptive statistics

In this part, the trade balance and exchange rate of the country are analyzed with switching regression approach. According to the government regulation Myanmar face parallel exchange rate system and the separate rate of exchange was conducted between private and public sectors. Additionally, exchange rate of Myanmar under new decretive government, also included in the descriptive statistics to know the effects of these new government reforms on the exchange rate policy of Myanmar.

3.6 Data of the Study

3.6.1. Data Collection

All the data which used in this study's econometric models are extracted from International Monetary Fund (IMF), World Trade Organization (WTO), Central Statistical organization of Myanmar, Central Bank of Myanmar web pages, and official data from Myanmar's Ministry of Commerce for the solidity and validity of the study. They can admit sufficient level of information and data related with trade balance and exchange rate statistics of Myanmar.

Regarding the methodology section, trade balance, market exchange rate, export and import data are needed for doing Switching Regression model estimation. In order to deepen the soundness of this analysis, the time series data on Trade Balance, Market Exchange Rate, Export and Import are required. For this reason, annual data of Trade Balance, Market Exchange Rate, Export and Import are taken from 1986 to 2015. For running time series data, at least 30 observations are needed, therefore it started collecting from 1986 to 2015. Thus, there are 30 time series data for each variable regarding econometric analysis, three data (GTB, GEX,GIM) used in value in growth rate forms, and one data (GMER) used in kyat per in Switching Regression model estimations.

3.6.2 Data Description

The descriptive statistics of the data used in this study are depicted in the following table.

Table 3 Descriptive Statistics of the variables

Variables	Observations	Mean	Standard Deviation	Minimum Value	Maximum Value
GTB	29	0.200388	2.383778	-5.128312	9.290939
GMER	29	0.141473	0.261223	-0.178569	1.137021
GEX	29	0.128484	0.250543	-0.590200	0.603261
GIM	29	0.142439	0.383118	-0.673459	1.392437

Source: Calculated result by author

In table 3 the descriptive statistics of each variable are depicted. In the study, there were 29 observations after adjustment with growth rate. The mean value is the average value of all observation in the data set, in this study the mean value of GTB is 0.20, GMER is 0.144, GEX is

0.12 and GIM is 0.14 respectively. The standard deviation is a measurement of diversification in the distribution of the data, when tested the data the value of standard deviation of GTB is 2.28, GMER is 0.26, GEX is 0.25 and GIM is 0.38 separately. In the data set of the study, the value which is smallest is called minimum value, in the study the minimum value of GTB is -5.12, GMER is -0.17, GEX is -0.59 and GIM is -0.67. The maximum value in data set is the value which is largest in the observation and these two numbers, maximum and minimum value, used to calculate of the range of the data.

4 Empirical Analysis

The impact of exchange rate fluctuation on trade balance will be investigated into two separate ways in this chapter: exploratory data analysis and descriptive analysis. In the first section, the running of the data and analyzing of the data is presented by using Simple Switching Regression model to find out the result of the impact of currency appreciation and depreciation on trade balance. Moreover, the facts of how exchange rate affected the trade balance, how currency appreciation influences the trade balance and how currency depreciation forces the trade balances of Myanmar will be examined based with the empirical results. In the second part of the section, the impact of exchange rate policy change by government on trade balance of the country will be illustrated by using descriptive statistics.

4.1 Exploratory data analysis

The exploratory data analysis is operated in two steps. In first step of the study, the Augmented Dickey-Fuller (ADF) unit root test is used to verify the stationary condition of the data set. In order to use Switching Regression estimation, all the time-series data have to be stationary. After analyzing all the data that used in the study is stationary, Switching Regression estimation is operated as the second step of the analysis.

4.1.1 Augmented Dickey-Fuller Unit Root Tests

In order to use Switching Regression estimation and to become aware of the impact between the four variables, GTB, GMER, GEX and GIM, it is needed to verify whether all the data used in the study are stationary or not. Accordingly, the stationary qualities of the time series variables are checked by using Augmented Dickey-Fuller unit root test. In this analyzing, the null hypothesis

for that time-series is not stationary. If the test statistics is less than five percent, the null hypothesis can be accepted, which means that the time-series stationary, and if the test statistics is greater than five percent, the null hypothesis cannot be accepted. In the following Table 4.1 the ADF unit root tests are illustrated.

Table 4 Augmented Dickey-Fuller unit root tests results

Variable	ADF Test statistics	Critical value at 5%	Critical value at 10%	Deterministic Regressors	Lag	Results
GTB	-4.913946	-2.971853	-2.625121	intercept	6	Stationary
GMER	-4.077696	-2.971853	-2.625121	intercept	6	Stationary
GEX	-5.506281	-2.971853	-2.625121	intercept	6	Stationary
GIM	-6.783139	-2.971853	-2.625121	intercept	6	Stationary

Source: Calculation, at level

According to the tested data result, as shown in Table 4, all variables, GTB, GMER, GEX, GIM are stationary at level in testing with intercept. The Null hypothesis can be rejected for all three time-series; this means that all the variables are stationary at level when testing with either intercept or trend. The time-series data of all the variables are significance at five percent critical level.

4.1.2 Switching Regression Estimation

After verifying that all the variables are stationary, Switching analysis can be continued to analyze. In this model, a switching regression equation sorts individuals over two different states, one for depreciation and another for appreciation When the independent variables in the regressions are identical and there is only one dependent variable, only one equation required to be specified. Additionally, both equations must be specified when the set of exogenous variables in the first regression is not the same as the set of exogenous variables in the second regression.

Table 5 Switching Regression Model estimation results

		Coef.	Std.err	z-test	P-Value
Regime 1	GMER	-26.40294	6.023651	-4.383213	0.0000
	GEX	26.53337	3.515041	7.548524	0.0000
	GIM	2.040663	1.756246	1.161946	0.2453
	Constant	-4.512489	1.247411	-3.617483	0.0003
Regime 2	GMER	-0.782448	0.729458	-1.072644	0.2834
	GEX	-2.186205	0.916216	-2.386123	0.0170
	GIM	4.133699	0.824671	5.012546	0.0000
	Constant	0.232435	0.227835	1.020191	0.3076
Common	LOG(SIGMA)	-0.271772	0.164038	-1.656765	0.0976
Probabilities Parameters	P1-DUM	-1.905686	0.770833	-2.472242	0.0134

In table 5, Region 1 described the result of currency appreciation impact on trade balance. According from those empirical results it can be seen that when market exchange increases 1 %, the trade balance of the country will reduce with 26.40%. Moreover, to be explained clearly, among 29 observations, the country faced currency appreciation such as year of 2012. In one year, currency may fluctuate month to month or day to day, but in the sum of the year currency appreciated. For that year, when the growth rate of the market exchange increased (case of currency appreciation), 1 % the trade balance reduced by the amount of 26.40 %. In region 1, the market exchange rate is significant. This means that the hypothesis cannot be rejected and the currency appreciation can reduce the trade balance of the country. When the export increases by 1 %, the trade balance of the country increases by 26.53 % and when the import is increases by 1 % the trade balance will increase by 2.04 %.

In the case of Region 2, there is described the result of currency depreciation impact on trade balances. According from those tested result, it can be seen that when market exchange increases by 1 % the trade balance of the country, Myanmar, will reduce with 0.78 % instead of improve the balance of trade. Additionally, to be explained more clearly, the country faced currency depreciation, such as the year of 2013. In one year, currency may depreciate or appreciate over the time, but in the sum of the year the currency depreciate. For that year, when the growth rate of the market exchange increased by 1 % the growth rate of trade balance reduced by the rate of 0.78 % instead of improve trade balance. In region 2, the market exchange rate in not significant. This means that the hypothesis of the study can be rejected and the currency depreciation may not improve the trade balance of the country. When the export increases by 1 % the trade balance is reduced by 2.19%.

4.2 Descriptive analysis

This descriptive study analyzes the trade balance and exchange rate of Myanmar during the period of 1986 to 2015. The study period can be separated into two circumstances; (i) exchange rate before 2011, under military government and (ii) exchange rate after 2012, under new democratic government. In this part of analysis, the above two circumstances of Myanmar descriptive statistic of exchange rate and trade balance is discussed with some government reforms which adopted in each period.

4.2.1 Foreign Exchange Market before 2011

In 1988, after abolishment of the socialist economic system, the market oriented economic system was adopted in the country. In Myanmar, the multiple exchange rate system took place over the last several years because the fixed exchange rate system of government policy was not activated in the private sectors. Foreign exchange transaction was controlled by the government. Under that control the exchange rate regime of the country was separated into two regimes: official rate and market rate. Among these two kinds of exchange rate, the official exchange rate determined by the government was activated only on the public sectors like state economic enterprises. The state economic enterprises were obligated to hand over all of that at the official rate. On the other hand, the imports of state economic enterprises were managed by the foreign

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exchange budget of the central government. Therefore permission from the Ministry of Finance and Revenue was required for expenditure on foreign trade.

In the private sector, no importers used the official exchange rate in conducting the economic activities which is seriously overvaluing against the U.S dollar. This is the main reason why the black foreign exchange market arose in Myanmar. According to the government regulation, in private sectors the Myanmar citizens were prohibited from holding foreign currency. Instead of it they can withdraw only the foreign exchange certificates in the form of foreign currency deposits.

According this circumstance, the market of foreign exchange was separated between the private and public sectors. There was no foreign exchange flowed from public sector to private sector, whereas the public sector could deviate private sector foreign currency deposit to its budget. This incentive gave the government control on the private sector. The segmented foreign exchange market structure expressed that the parallel market exchange rate was influenced by the supply and demand of the private sector.

In 1997, the export first and import later was adopted and the private sector was significantly controlled by the government. Therefore, all the export and import by the private sector had needed licenses. The government issued the import licenses, and license applicants have adequate export tax subtracted export earnings to cover the import bill. In 2002, the rigorous practice of the export first policy, if there was without foreign currency deposits the import impossible.

In the parallel market, there were two typical types of foreign exchange. The first one is the export earnings in the form of foreign currency deposits with verification of export tax payment. The other is informally held foreign exchange, in the case of illegal export revenues and informal payments. The official exchange rate and market exchange rate before 2012 was show in terms of domestic currency per dollar. The percentage of change of market exchange rate was also depicted. The official exchange rate fixed by the government did not fluctuate much and that rate was differenced from over 200 times when compared with the market exchange rate in 2007. It means Myanmar official exchange rate was over valued than actually conducted market exchange rate.

Figure 6 Market and official Exchange Rate of Myanmar before 2012
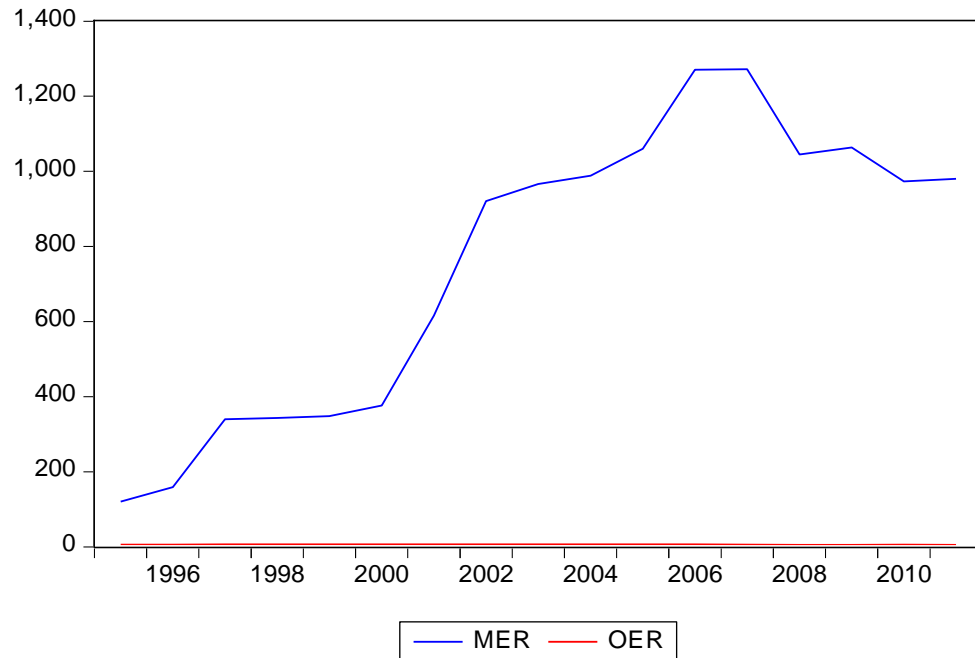
Source: Central Bank of Myanmar

In figure 6, it can be seen the significant difference of the official exchange rate and market exchange rate. The market exchange rate fluctuates over time as a result of market force outcome and the official exchange rate is nearly striate line which means it does not fluctuate and is stable at the rate between 5 to 8 kyats per dollar. As a result of being under government, that rate was only operated at public sectors like state owned economic enterprises. Therefore, in the Myanmar exchange rate market, the black exchange market problem appeared in last decades and it hurt economy's economic conditions worse.

Figure 7 Market Exchange Rate Trade Balance of Myanmar before 2012
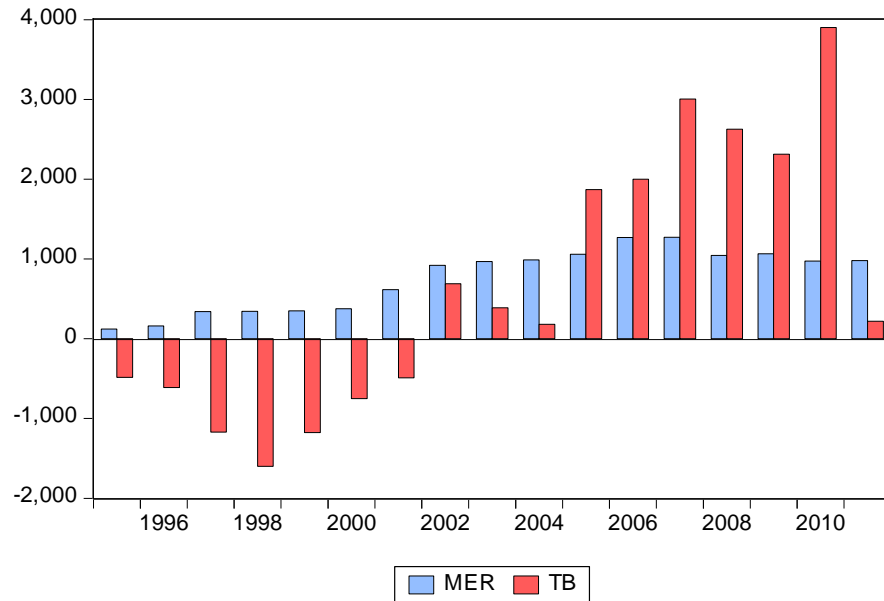
In figure 7, the market exchange rate and trade balance of Myanmar before 2012 was illustrated. The MER is stand for market exchange rate and TB is for trade balance of the country. The market exchange rate of the country depreciated most of the year. The trade balance of the country faced deficit in the early years until 2002 and it was worse around 1997 and 1998 which may have been caused the impact of Asian crisis. After 2002 until 2012 the trade balance faced surplus which may cause by the export of natural gas in the country. According these facts, it can be considered the trade balance can be impacted by not only exchange rate system but also the other factors.

Figure 8 Official Exchange Rate Trade Balance of Myanmar before 2012
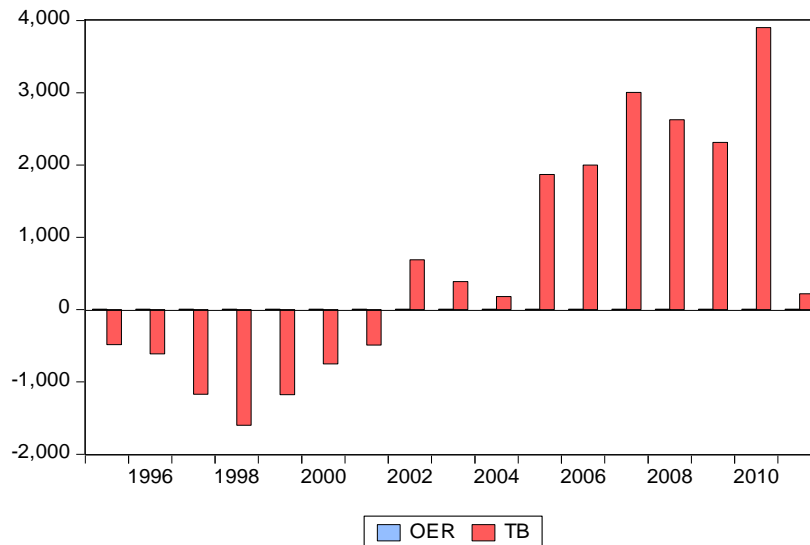
The official exchange rate and trade balance of Myanmar before 2012 was compared in the figure. In the figure the official exchange rate is a very low amount to influence the trade balance of the country. The official exchange rate was fixed around 6 to 8 kyats per dollar in the first part of analysis year of 1986 to 2011. Although exchange rate was fixed, the country's trades balance deficit and surplus by the time as a result of other economic outcomes.

4.2.2 The Reforms on Exchange Rate after 2011

The series of reforms on exchange rate policy was operated under the new government starting in late 2011. In this reform, the Central Bank allowed some private commercial banks to operate legalized foreign exchange counters. At that counters retail customers of foreign exchange could purchase and sell foreign exchange with these licensed banks. However, there were unexpressed dominance by the Central Bank of Myanmar in purchasing and selling rate, and there were some notice on the foreign exchange counters. Moreover, another important case is the Central Bank placed limits on the amount of foreign exchange which a customer could sell and purchase at the counters. Above the amount of limits, a customer has to exhibit a document verifying the source of selling foreign exchange or the purposed use of buying foreign exchange. The transactions at the foreign exchange counters include kyats and cash of US dollars. The amounts of transactions are inescapably limited by the availability of cash of the counters.Before this reform program was conducted, the local currency kyat was pegged to the special drawing right at the rate of 8.51 kyat

per special drawing right. This had been overvalued unrealistically. Under that foreign exchange regime of Myanmar, the domestic foreign exchange market had occurred at the different exchange rates regime. This malpractice of exchange rate has stimulated price distortions, inefficient allocation of resources, and risks to macroeconomic stability and economic development.

In April 2012, the government affected certain reform steps to unify the multiple exchange rates into a single rate in the country by replacing the official fixed exchange rate with a managed float through foreign exchange auction market under supervision of the Central Bank of Myanmar. Under the foreign exchange regime, the reference rate deliberated in the auction mechanism. The Central Bank of Myanmar released licenses to perform international balking to a number of private banks. Consequently, the variation between the reference rate and the informal market rate decreased significantly.

On the one hand, the CBM was declaring the reference exchange rate to the public, and on the other hand was the auction of foreign exchange with private commercial banks. The selling and purchasing rates at the legal foreign exchange counters have to be within a mandated band from the reference rate.Another important development in 2012 is that the Central Bank planned to open up private banks the license to receive foreign currency deposits and to perform foreign exchange operations such as remittances and settlements of foreign trade. In the early decades, the foreign exchange operations were controlled by state banks. This policy change is expected to ease the trade of the private sector.

The new government has enforced a stepwise reduction of the limitations on imports since 2010. Moreover, the export first policy was abrogated in April 2012. Import licenses are now procurable with non-export earning US dollar lifted at the foreign exchange counters of with the informally held foreign exchange. To clarify what has changed and what has not changed after the series of policy reforms, in the case of changed, firstly, the official exchange rate in the public sector have been devalued to the central bank reference rate. Regarding in the case of unchanged, the mass of foreign exchange transactions in the private sector are still negotiated transactions between buyers and sellers, and they are yet to be replaced with bank intermediation. Export earnings mostly persist as the assets of exporters. They are not sold to the banks; therefore, the central bank cannot absorb foreign exchange from that source. The central bank auction and the open market of the private sector are still fragmented.

Moreover, a new Foreign Exchange Management Law was passed by the parliament in August 2012. By this law, all restrictions on current payments and transfers for foreign transactions were clearly lifted. The CBM also declared a redemption plan for the foreign exchange certificates which were generated as a temporary vehicle for the accessible use of foreign currency under previous strict control mechanism. According to these reform steps, the pressure on appreciation of exchange rate is now constrained and the market exchange rate has been stable around the reference rate. The central bank will perform additional steps to facilitate the smooth functioning of the formal foreign exchange markets and entitling private banks to extend foreign exchange operations and services at per state banks. Although the central bank is endeavoring for establishing an interbank foreign exchange market, the market is too little for the market intervention to be impressively performed.

The official exchange rate and market exchange rate of Myanmar was illustrated in the terms domestic currency per dollar after 2012. From that figure of the data we can find out these two official and market exchange rates are not so different as a result of new government reforms of exchange rate policy by using unification of exchange rate system, which means that both private and public sector operate with the rate between the ranges of which the central bank conducted.

Figure 9 Market and official Exchange Rate of Myanmar after 2012
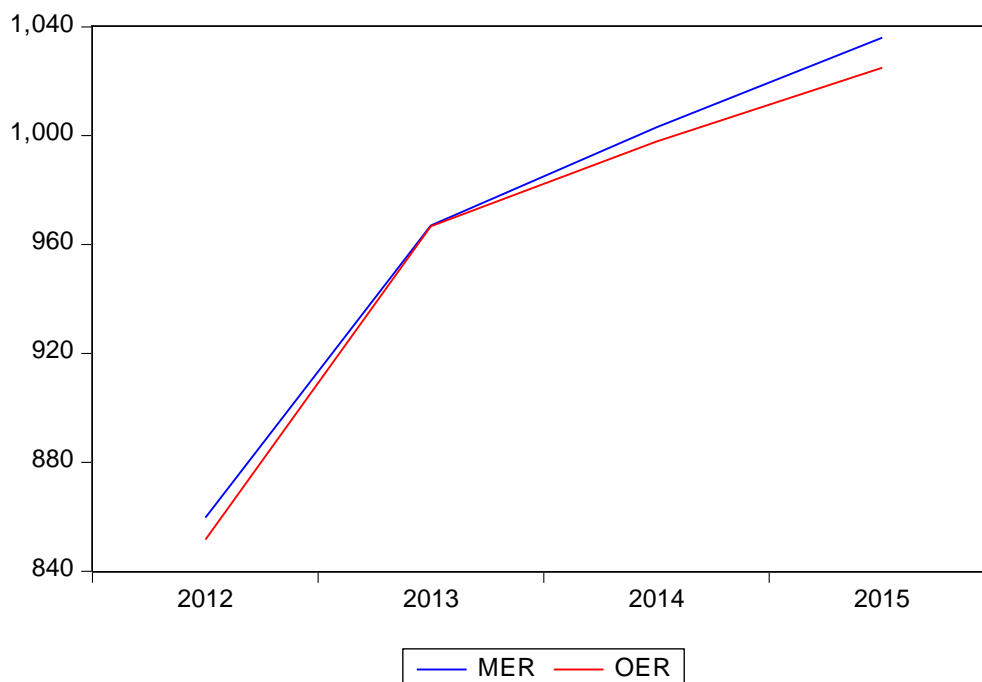
In figure 9, it can be seen the smooth trend of the two exchange rates are near the same after 2012 according to the reform by the government. It is significantly different from the condition of market and official exchange rate of before government reforms. These two exchanges rates, official and market rate, can be seen as depreciated during most of the year. In the previous years, the official rate was overvalued over 200 times when compared with the market exchange rate. But under the new government, the gap between two exchanges was narrowed and there is not so much difference between these two types of exchange rate.

Figure 10 Market Exchange Rate Trade Balance of Myanmar after 2012
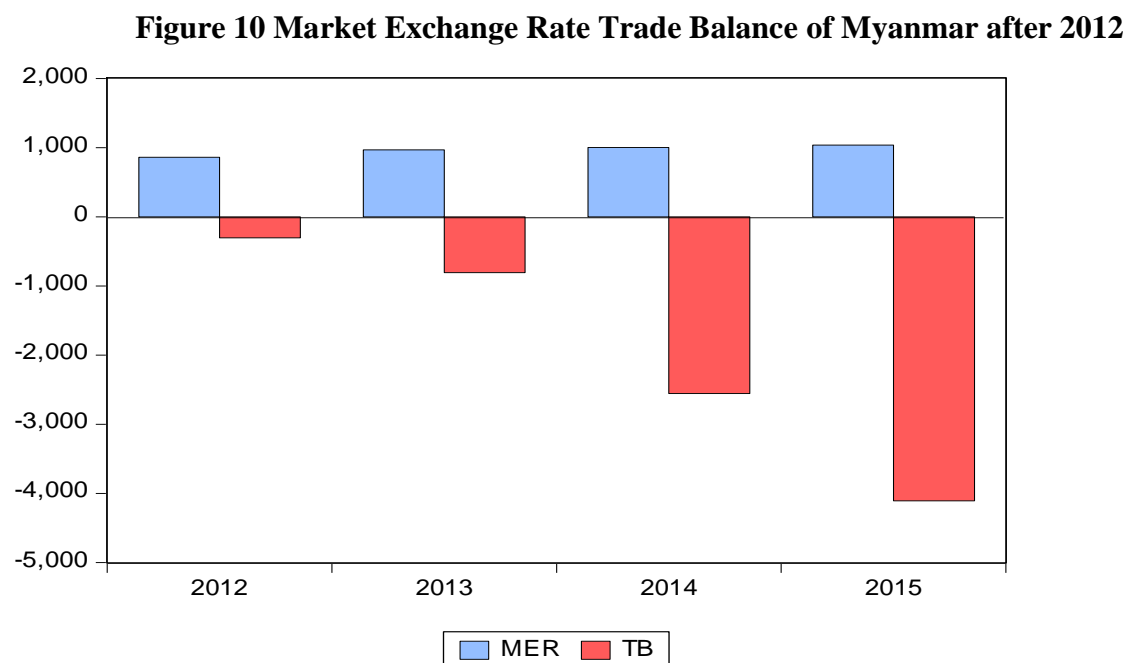

Figure 10 shows the market exchange rate and trade balance of Myanmar after 2012 especially under new government. The market exchange rate depreciated slightly year by year. According the theory, if the currency depreciates, the trade balance will be improved, but in the case of Myanmar although the currency is depreciated over time the trade balance reduced year by year.

Figure 11 Official Exchange Rate Trade Balance of Myanmar after 2012
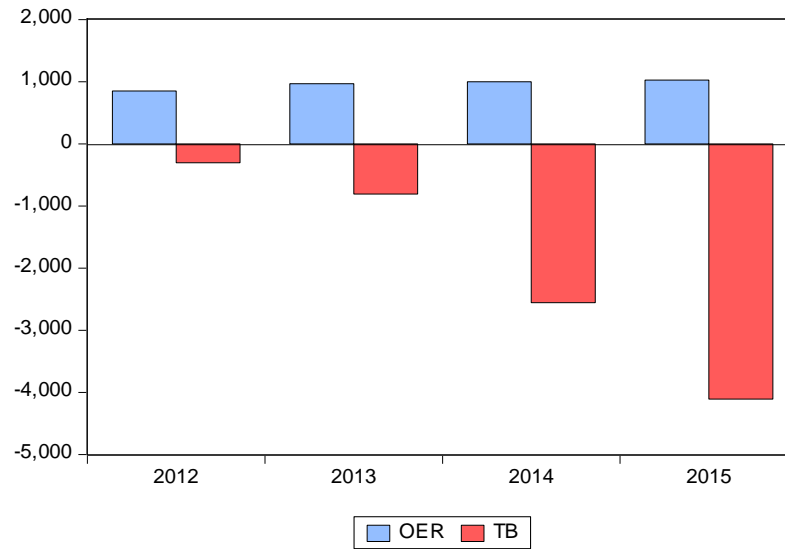
Figure 11 the official exchange rate and trade balance of Myanmar after 2012 is illustrated. Under new government reform, especially of the unification of the exchange rate policy by changing exchange rate system from fixed to manage folate exchange rate, the two exchange rates were nearly the same.

5. Summary

The main objective of this study is to examine and find out the impact of exchange rate on trade balance of Myanmar over the period of 1986-2015 primarily with the empirical analysis and general descriptive statistics. The data set employed in this study is secondary data of trade balance (TB), Export EX) and Import (IM). These three variables were used into value in US dollar million term and market exchange rate (MER), and the official exchange rate (OER) of Myanmar during the period 1986-2015 were used into kyat per dollar term, respectively.

This study adopted two main methodological approaches in order to find out the appropriate answers to the research problem. Firstly, econometric methods were used such as Dickey-Fuller unit root test, Augmented Dickey-Fuller unit root test, and Switching Regression molel. Empirical results are mainly based on the above econometric methods. Secondly, exchange rate of Myanmar during the period of befor 2012 and after 2012 under new government 1995-2015 was analyzed by using descriptive analysis.

The results of this study is somewhat contrary to conventional belief that exchange rate has significant impact on the trade balance of Myanmar. Exchange rate does have positive impact on trade balance in the long-run indicating that a depreciation can lead to improvement of trade balance and an appreciation can lead to deterioration of trade balance. But in Myanmar after 2011, although the exchange rate depreciated the trade balance did not improve at that year and the trade balance face deficit. Currently, depreciating real exchange rate to improve trade balance cannot take much effect.

The results found in this study are (1) the currency depreciation did not improve the trade balance of the country but the currency appreciation reduced the trade balance of the country; (2) the fixed exchange rate system of the country conducted by the government caused the country to face a parallar exchange rate between public and private sectors; and (3) after the reform, the exchange rate policy by new democretive government in 2012 adopted the policy which try to reduce the range of exchange between official and market to be not so different.

The country faced an inapproate exchange rate system over the last decades that made the country worse in economic conditions and the country trade balance deficit in the several years. After the government reformed the unification of exchange rate in 2012 although the the country's official exchange rate and market exchange rate were not so different, the depreciation of the currency could not improve the balance trade of Myanmar. Therefore, the policy makers should care about not only exchange rate policy reform but also other policy reforms which can affect the trade balance of the country.

Chapter IV

The Relation between Exchange Rate and trade flows of Myanmar and her Major Trading Partners: Analyzing by Gravity Model Approach

1. Introduction

The exchange rate is one of the critical economic indicators in managing the country's international trade and one of the essential determinants of the country's economic health. The exchange rate is an important matter of economic progress because it mainly reflects the benefits of the physical and commodity sectors and creates competitiveness in relation to the global economy. (Long Vorlak, Ignatius Abasimi, Yang Fan, 2019) One main argument against flexible exchange rates is that exchange rate volatility could negatively affect trade and investment. If the exchange rate volatility increases, it fosters risk in foreign trade activities and will lead risk-averse agents to reduce their export and import activity. The exchange rate volatility usually means uncertainty in international markets; therefore, increasing exchange rate volatility translates into a decrease in foreign trade volume. According to Bayoumi and Eichengreen (1995), the relationship between trade and other macroeconomic performance might differ between developed and developing countries. Therefore, this study also includes the variable of classification of countries and analyzes how these diffident classes of countries affect trade in which direction.

The effect of exchange rate volatility on trade flow may have through several channels. According to the Mohsen Bahmani-Oskooee, there are four significant channels of the effect of exchange rate volatility on trade flows: reduce trade activities of the risk-averse trader; reduction of trade volume by making prices and profits uncertain; switching on buying of resources from foreign to domestic source with persistence exchange rate volatility, and adverse effect on foreign investment decisions which in turn could lower the volume of trade. In Myanmar, after significant political transformation and reforms, the exchange rate and trade policy reforms include one of the crucial roles of policy reform. There were experienced significant changes in foreign trade issues. This process began with redirecting import-less to the liberation of trade. Their initial limited interaction with the world economy was based more on the state restrictions; however, nowadays, this former relatively isolated trade bloc has turned into a region with liberations on trade. Thus, the structure and intensity of trade flows have significantly changed.

Management of the exchange rate is considered to be one of the major policy objectives in Myanmar to achieve a set of diverse objectives of economic growth, containment of inflation, and maintenance of external competitiveness. The policy suggests that a wrongly managed exchange rate regime can impede improved economic performance. The exchange rate management reform was an important component of trade liberalization measures that Myanmar undertook, eventually replacing the earlier 'fixed exchange rate system with a 'floating exchange rate regime.

In Myanmar, the multiple exchange rate system took place for nearly two decades because the fixed exchange rate system of government policy was not activated in the private sector. It is the main reason for the emerging black market of foreign exchange, and this misalignment of exchange rate policy deter the country's economic growth by a deterioration of the foreign trade sector of the country. Although the exchange rate is a peg with a specific range from 1960 until 2011, this official peg rate is only activated in the government sector. The black-market exchange rate problem emerged, and most private sectors activated with the parallel market rate. This study estimated the market exchange rate volatility to analyze the interest impact. Under the new government, in April 2012, the government affected specific reform steps to unify the multiple exchange rates into a single rate in the country by replacing the official fixed exchange rate with a managed float through the foreign exchange auction market under the supervision of the Central Bank of Myanmar. Moreover, the new democratic government tried to establish most of the economic policy reforms in respective sectors of the country. It also relaxed the trade sector regulation and eased the complexity of the FDI procedure. And then, the Western countries lifted most of their sanctions on Myanmar by the end of 2012 (Kobu).

This analysis attempts to explore the effects of exchange rate policy reform and its significant effects of it on aggregate bilateral trade flows of Myanmar and its nine major trading partners, namely China, Japan, Hong Kong, India, Republic of Korea, Malaysia, Singapore, Indonesia, and Thailand, by employing gravity model of trade. The gravity models have been estimated by various literature, which is recognized as the prominent model in projecting the bilateral trade between countries i and j using the panel data techniques. The following figure shows the trade flows between Myanmar and Major trading partners from 1988 to 2019.

Figure 1 Trade between Major Trading Partners
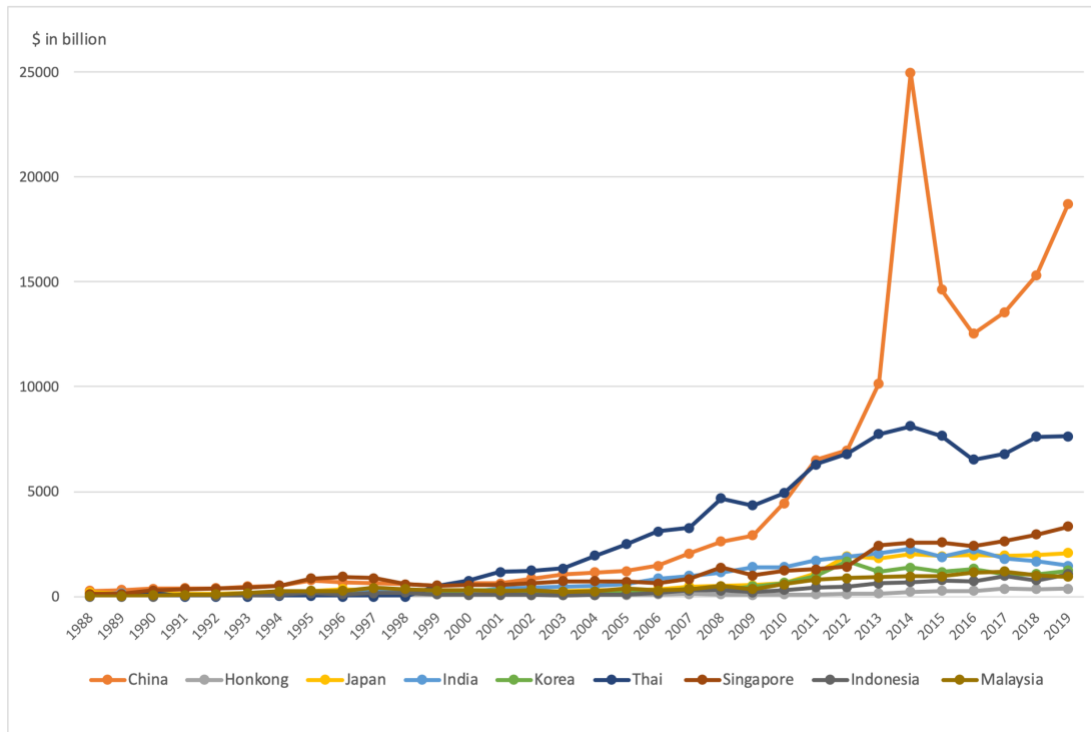
Source: Central Statical Organization

Figure 2 Export Volume between Major Trading Partners
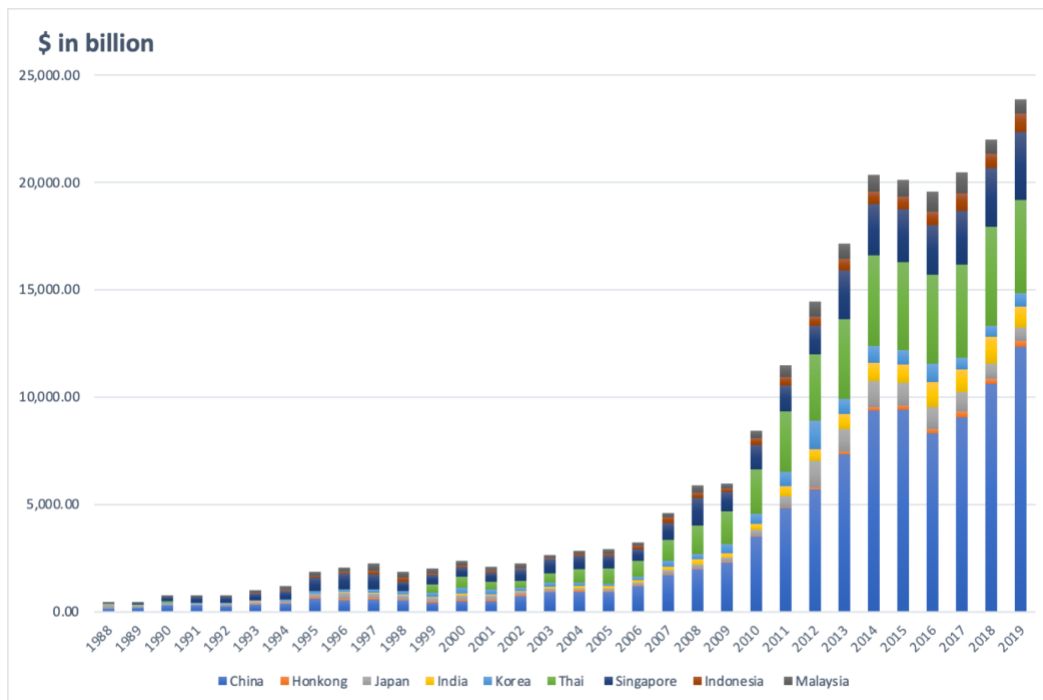
Source: Central Statical Organization

Figure 3 Import volume between Major Trading Partners
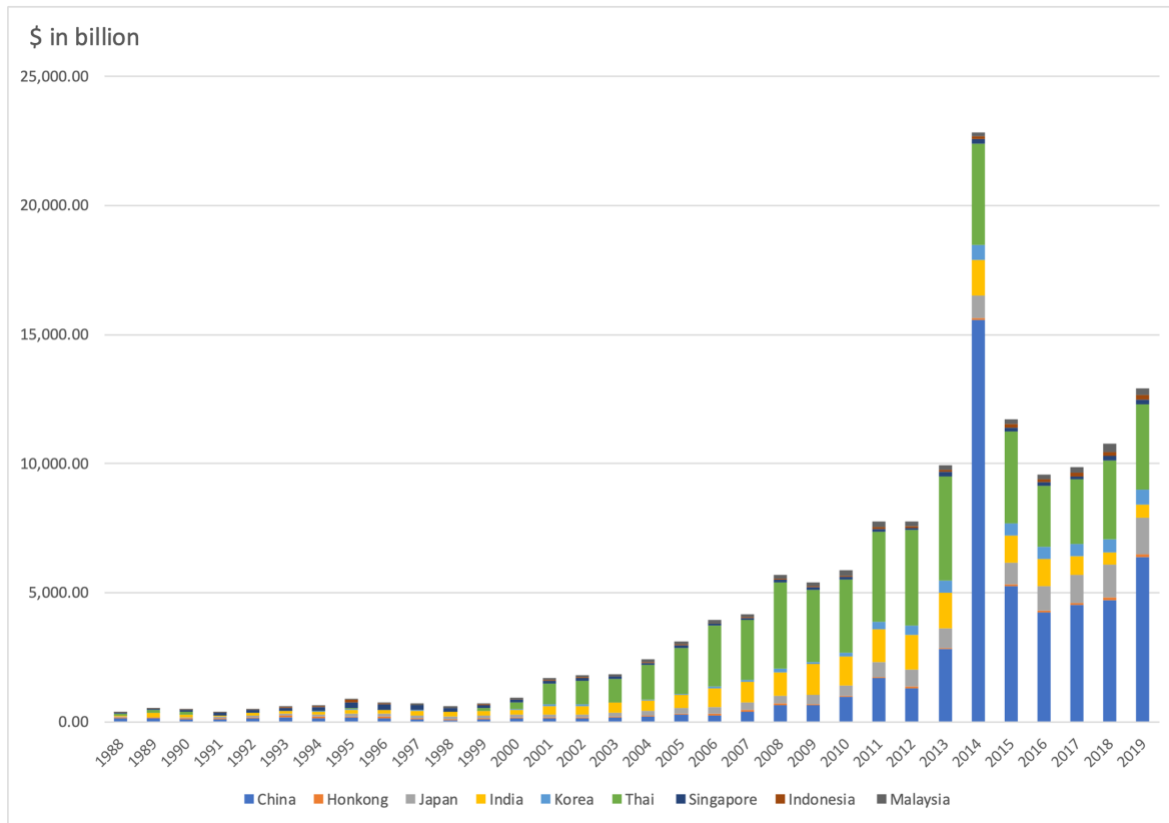
Source: Central Statical Organization

China is the largest trade partner in export and import volume among trading partners. Before 20the century, Myanmar's trade sector was very low compared to the 20th century. As the policy failure of Myanmar, she is isolated from the world in the economic transaction because of applied the closed economy. Because of the failure of the policy, the policy marker was transformed and liberalized their economy after 2000. Specifically, after the 2011 election, there were many policy reforms, including exchange rate policy and trade policy especially trade liberation to the private sector. After these policy reforms, the trade activities of Myanmar with the external economy are dramatically increasing.

2. Literature Review

Three groups of studies in the literature have investigated the impact of exchange rate volatility on trade flows. Several theoretical studies have proved by empirical analysis that increasing in exchange rate volatility will depress the volume of international trade, such as Ethier (1973), Belenger et al. (1988), and Peree and Steinherr (1989). On the other hand, some theoretical

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studies have shown that increased volatility in exchange rate might have positive effects on trade flows, such as Franke (1991), McKnzie (1999), and Kasman (2005). However, some theoretical studies could not be precise any significant relationship between exchange rate volatility and trade, such as Gotur (1985), Gagonon (1993), and Aristotelous (2001).

Aricia (1998) analyzes the effects of exchange rate fluctuation on trade flows from the European Union using the gravity model and panel data analysis. That analysis used different variables as proxies for uncertainty and found evidence of a small but significant negative effect of bilateral volatility on trade. Bahmani-Oskooee (2002) investigated the impact of black-market exchange rate volatility on the Iranian economy's trade flows by using cointegration analysis. That investigation found that even if some developing countries maintain a relatively fixed official exchange rate, the black market rate volatility could adversely affect the legal trade flows between countries. S Subanti et al. (2019) examined the exchange rate volatility and exports using panel data analysis for ASEAN countries. That study applied pooled least squares method, the fixed effect method, and the random effect method, and the finding of that study showed that the exchange rate volatility harms exports.

Hasnov et al. (2011) analyzed the exchange rate risk and trade flows of Kazakhstan using the gravity equation approach and GARCH model employed to estimate the exchange rate uncertainty. Their study indicates that the gravity model concept better explains the bilateral trade between Kazakhstan and potential trade partners. Furthermore, the exchange rate risk discouraged the potential of Kazakh trade during the de facto floating exchange rate regime, and the effect of exchange rate risk on bilateral trade is found to be ambiguous. The problem of choosing an exchange rate uncertainty proxy has been debated among researchers. According to McKenzie, 1999, the previous literature has identified the unobservable risk and contributing factor for the inconclusive evidence and difficulty in uncovering the actual relationship between exchange rate risk and trade flows. Many uncertainty measures have been used in the wide range of literature. Rose,2000, used the standard deviation of the percentage change of exchange rate as a risk proxy, and Baum et al., 2004 employed the generalized autoregressive conditional heteroscedasticity GARCH family models as a proxy of exchange rate risk.

Jana (2016) examined the relationship between exchange rate volatility and foreign trade in Visegrad countries using panel regression applied to the gravity model. Those studies also point out that the uncertainty in exchange rate decreases foreign trade turnover on the bilateral level.

The effect of this risk was diffident in different countries and commodity groups. However, the effect of uncertainty depresses different commodity groups in different countries of Visegrad countries group. Thai Tri Do (2006) explored the bilateral trade between Vietnam and twenty-three European countries based on a gravity model and panel data. That estimated result illustrated that real exchange rate, economic size, and market size play a major role in bilateral trade between Vietnam and these European countries. Distance and history do not significantly impact their trade flow, and Vietnam's trade with these twenty countries has considerable room for growth.

Mustafa and Jing (2010) examined the impact of exchange rate volatility on sectoral trade flows between the United States and its top thirteen trading partners. This investigation points out three main pieces of evidence: exchange rate volatility does not systematically affect sectoral trade flows, income volatility has little impact on trade flows, and the effect of the interaction term on trade flows is opposite that of exchange rate volatility dampening its impact on trade flows. There are previous studies of the impact of trade liberation and lifting of economic sanctions on trade and non-resources export potential in Myanmar. However, there is a lack of previous studies concerning exchange rate volatility in trade. Therefore, this study would like to contribute to this gap.

3. Data and methodology

3.1 Data

The data set used in this analysis procures from reliable data sources from the world bank, the Central Statistical Organization of Myanmar, and the International Monetary Fund (IMF). This empirical analysis uses the yearly data for the period from 1988 to 2019. Data for bilateral exports and imports is accessed from the IMF's Direction of Trade Statistics (DOTS). Data on GDP and per capita GDP acquire from the world bank data source, and the data for distance in this analysis used units of miles and collected from the web page of indo.com19. Furthermore, to explore the effect of policy reform and other trade agreements between the major trading partner using dummies variables indicating policy reform, ASEAN, country classification, and border. All the variables in this analysis are used in log form apart from dummies variables.

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[19] Courtesy of Indo.com - discount Bali hotels, this service uses data from the US Census and a supplementary list of cities around the world to find the latitude and longitude of two places, and then calculates the distance between them (as the crow flies).

3.2. Measuring the Exchange Rate Uncertainty

There is no specific way when measuring the exchange rate risk. Some researchers suggest the measurement of exchange rate volatility using Moving Average Standard Deviation (MASD), and some researchers applied the Generalized AutoRegressive Conditional Heteroskedasticity (GARCH) model. Kenen and Rodick (1986) introduced the measurement of exchange rate volatility by the moving average method, and several researchers were followed that measurement afterward as follows:

$$VOLEXR_t = [(1/m)\sum_{i=1}^{m}(lnEXR_{t-1} - lnEXR_{t-2})^2]^{1/2} \tag{1}$$

According to this equation, it can be determined lnEXR is the log of exchange rates, and m is the degree of moving average. The variables lnEXRt-1 and lnEXRt-2 are represented as a log value of the exchange rate of the one and two previous periods. There are some limitations in MASD model. Some studies used AutoRegressive Conditional Heteroskedasticity (ARCH) model to compute the exchange rate volatility to eliminate the limitation of MASD.20. However, measuring volatility by ARCH model also generated the problem related to the inferences drawn from the model's output (McKenzie, 1999).

4. Specification of the Model and Technique of Estimation
4.1 Modelling of Gravity Model

Gravity models have been verifiable to be very successful at projecting the countries' bilateral trade flows and have been widely used in empirical work in international economics. The central concept behind a Gravity model is that the trade volume between two countries, measured either as bilateral imports, exports, or total trade, increases with the products of their size and decreases with the distance between them. Many panel data studies of exchange rate volatility's effect on trade are based on gravity equations. (Hasanov, 2011) The idea is that countries with a larger economy tend to trade more in absolute terms, while distance represents a proxy for transportation costs, and it should depress bilateral trade.

The origin of the gravity model came from the famous Newton's universal law of gravitation in physics. In 1962, Jan Tinbergen was the first initiator who applied this gravity model to analyze

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[20] See Pozo (1992), McKenzie and Brooks (1997), Jana (2016) and McKenzie (1998)

international trade flows. After that, most researchers followed and applied this model in the empirical analysis of trade flows. The simple origin gravity model is as follow:

$$TRAD_{ij} = C \frac{Y_i Y_j}{D_{ij}} \tag{5}$$

where C is a Constand term. TRADij is total trade flow from country i to country j. YiYj are gross domestic product or gross national product, and the product of YiYj expresses the economic size of countries i and j, which may positively affect trade. Dij is the distance between country i and j and the proxy factor of transportation cost, which may negatively impact trade.

In general, a per capita income variable is included to represent specialization, richer countries tend to be more specialized, and thus they tend to have a larger volume of international trade for any given GDP level. Models often include dummy variables to control for different factors that might influence transaction costs and the trade flows. In this analysis include fours dummy variables that might effect on trade: exchange rate policy reform, membership of ASEAN, a common border, and income classification of the countries.

This analysis utilizes gravity equations to examine the trade flow between major trading partners of Myanmar. The previous literature on analyzing bilateral trade by gravity equations has been a robust theoretical foundation. Although there are different modifications of gravity models in the literature, they all include size and distance variables. (Hasanov, 2011). In this analysis, the proxy of exchange rate volatility and the dummy of exchange rate policy reform includes representing the effect of exchange rate uncertainty on trade flows. By employing this gravity model, this study will explore how the exchange rate uncertainty and policy reforms of Myanmar affect on trade flows of major trading countries. The simple form of gravity equation expresses as follows:

$$ln(T_{ij})_t == \beta + \beta_1 \left(lnDIS_{ij} \right) + \beta_2 ln \left(GDP_i GDP_j \right)_t + \beta_3 \left(ln\ EXVOL_j \right) + \beta_4 \left(D_{PR_j} \right) +$$

$$\beta_5 \left(D_{BORDER_{ij}} \right) + \beta_6 \left(D_{ASEAN_{ij}} \right) + \beta_7 (D_{CLAS}) + \varepsilon_{ij} \tag{6}$$

where T_{ij}t refers to total trade between countries i and j. In this study, i denote Myanmar, and j denotes major trading partner. $lnDIS_{ij}$ refers to the distance between country i and j, used in the unit of miles and inversely proportional to total trade. $ln \left(GDP_i GDP_j \right)_t$ refers to the multiply value of the gross domestic product of Myanmar and its major trading partner, respectively. This product of GDP is used to express the size of the economy, which is directly proportional to total trade

between countries. $EXVOL_j$ includes as the proxy for exchange rate volatility, and the expected sign of this proxy coefficient is negative. In addition, dummies variables are augmented in the gravity equation to explore the study's objectives. D_{PR_j} refers to dummies variable for exchange rate policy reform, and it denotes the policy adopting period represented by 1 and otherwise is 0. $D_{BORDER_{ij}}$ is the dummies variable for the border if the country i and j are border implies by 1 and otherwise is 0. $D_{ASEAN_{ij}}$ is dummies variable for ASEAN if the country i and j are member of ASEAN mention by 1 and otherwise 0. Moreover, D_{CLAS} is a dummies variable for the country classification by income, if country j is high and upper-middle income mentioned by 1, and if low and lower-middle mention by 0^{21}.

4.2 Technical Estimation by Panel Data Approach

For the estimation technique, this study utilizes a panel framework to cover Myanmar and its nine major trading partners during the thirty-two years of the study period from 1988 to 2019. Panel estimation reveals several advantages over cross-section and time-series data as it controls individual heterogeneity. Time series and cross section studies do not control for this heterogeneity and may give biased estimated results. Panel data offer more variability, more degree of freedom, and reduce the collinearity among explanatory variables. Therefore, it improves the efficiency of the econometric estimates. (Do, 2006) According to (Gujarati, 2005), the estimation of the panel framework can be developed by using pool OLS estimation, fixed effect, and random effect estimation.

The pooled estimation assumes one single set of slope coefficients and one overall intercept. It can be expressed as follow:

$$y_{it} = \alpha + \beta_i x_{it} + \varepsilon_{it} \tag{7}$$

This technique is similar to regression with time series or cross-section data. Nevertheless, it disregards the time and individuals' effects. The pooled estimation, however, may provide inefficient and biased estimated results because it assumes there are no individual effects and time effects.

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[21] New World Bank country classifications by income level: 2021-2022

To overcome this shortness, the fixed-effect model can take into account the individual and time effects by letting the intercept vary for each individual and time, but the slope coefficients are constant. It can be written as follow:

$$y_{it} = \alpha_i + x'_{it}\beta + \varepsilon_{it}, \quad \hat{\alpha_i} = \bar{y_i} - \bar{x_{it}}'\hat{\beta} \tag{8}$$

The main question is whether the individual-specific effects α_i are correlated with the regressor or not. If they are correlated, they have fixed effects; if not, they have a random effect model. The individual-specific effects are the leftover variation in the dependent variable that the regressors cannot explain. The weakness of this model is that it may not be able to identify the impact of time invariants such as the distance in this model, and this variable will be excluded from estimation. To overcome this problem, some researchers use the random effect model. The random effect treats the intercept as a random variable, and the individuals included in the sample are drawn from the larger population. It can be shown as follow:

$$y_{it} = X'_{it}\beta + (\alpha_i + e_{it}) \tag{9}$$

The random model assumes that the individual-specific effects α_i are distributed independently of the regressor and include α_i in the error term. Each individual has the same slope parameters and a composite error term$\varepsilon_{it} = \alpha_i + e_{it}$. The variance and covariance of this error term is $var(\varepsilon_{it}) = \sigma_\alpha^2 + \sigma_e^2$ and $cov(\varepsilon_{it}, \varepsilon_{is}) = \sigma_\alpha^2$ and $\rho_\varepsilon = cor(\varepsilon_{it}, \varepsilon_{is}) = \sigma_\alpha^2 (\sigma_\alpha^2 + \sigma_e^2)$. ρ_ε is the fraction of the variance in the error due to the individual-specific effects.

It is necessary to select the estimation approach in the panel estimation method. The Hausman test can be used to decide whether the regression is the best fixed or random estimation method. The null hypothesis of the Hausman test is that random effect is best fixed, and the alternative hypothesis is fixed effect. Therefore, firstly, the gravity equation of trade will be estimated by all three methods, and then Hausman Test will be estimated to check which method will be appropriate for our analysis.

5. Empirical Result

The estimation panel framework of the gravity equation by three different methods pool OLS, Fixed Effect and Random Effect model. Firstly, the Pool OLS regression model neglects the cross-section and time-series nature of data. It also denies the heterogeneity or individuality that may exist among the countries. Secondly, the Fixed Effect allows for heterogeneity or individuality

among partner countries by having its own intercept value. However, the intercept does not vary over time; this means that it is time-invariant. The next is the Random Effect model; in this model, all our countries have a common mean value for the intercept. After running these regression steps, it needs to be tested which model is suitable for our gravity equation by using Hausman Test. According to the Hausman Test, the p-value of 79.4% is insignificant because it is greater than 5%. Therefore, the Random Effect model is appropriate for the analysis.

The following table exposes the Random Effects estimation results of the model. The corresponding probability value of the Wald chi (2) is less than 5% and statistically significant. It means the coefficient of regressor in our model is not equal to zero, and it is a good model. The panel regressions analysis of the gravity model approach allows us to identify the dynamics of relationships among bilateral trade, the product of GDP, exchange rate vitality, exchange rate policy reform, and other dummies variables.

Table 4.1 Estimation Result of the Fixed and Random Effect Model

DEPENDENT LNT_{ij}	POOL LEAST SQUARE	FIXED EFFECTS	RANDOM EFFECTS
INDEPENDENT			
$lnDIS_{ij}$	0.0223 (0.0291)	0.0000	-0.5785 (0.6411)
$ln(GDP_i GDP_j)_t$	0.0993 * (0.0081)	0.8030* (0.0428)	0.7918* (0.0428)
$ln\ EXVOL_j$	-0.2978 * (0.3817)	-3.0847** (1.6521)	-3.0099** (1.6604)
D_PR_j	0.0895 * (0.0164)	0.2318** (0.1257)	0.2547* (0.1259)
D_ASEAN_{ij}	0.1987 * (0.0263)	0.0000	1.0793 (0.6816)
D_BORDER_{ij}	0.1861* (0.0185)	0.0000	0.8194 (0.6242)
D_CLAS	0.1903* (0.0219)	0.0000	1.1003* (0.5542)

CONSTANT	-3.4618*	-35.1219*	-31.9495*
	(0.3089)	(2.1742)	(5.3806)
R-SQUARE	0.7448	0.4227	0.7351
PROB F - STAT	0.0000	0.0000	0.0000
NO. OF OBS:	283	283	283
HAUSMAN TEST	0.7948		

According to the gravity model result, the coefficient of the product of GDP, β2, is positive; an increase in income encouraged this country to trade more. The coefficient of $ln(GDP_i GDP_j)_t$ implies that 1% increase in $ln(GDP_i GDP_j)_t$ leads approximately to 79 % increase in bilateral trade with major trading partners and statically significant at 1 % level. The coefficient of distance $lnDIS_{ij}$ parameter, β_1, is expected to be positive and it is not statistically significant. The sign of this coefficient should be negative, which may indicate that the distances of trading countries are inversely related to total trade value. Nevertheless, in our model, the result is inconsistent with the theory. Including the exchange rate volatility proxy to estimate the exchange rate uncertainty shows that exchange rate volatility depresses trade flow between Myanmar and its major trading partner.

The coefficient of dummy of exchange rate policy reform (D_PR_j), β_4 , is positive and it means the period of adopted exchange rate policy reform in Myanmar favors the trade flows. The sign of this coefficient should be negative, which may indicate that the distances of trading countries are inversely related to total trade value. Nevertheless, in our model, the result is inconsistent with the theory. Including the exchange rate volatility proxy to estimate the exchange rate uncertainty shows that exchange rate volatility depresses trade flow between Myanmar and its major trading partner, with a p-value is statistically significant at 5% level. And then, if the countries are a member of ASEAN, the bilateral trade between Myanmar and this trading partner have a positive relationship with a significant p-value. Furthermore, if the countries are bordering, it also a positive relationship between their bilateral trade. Moreover, if the partner of the trading country is high and upper-middle-income, the trade activity between the two countries may increase.

This study investigated three main research questions pertaining to the relationship be-tween the exchange rate and the trade flows of Myanmar. The empirical analysis re-veals that the

exchange rate policy reforms in Myanmar have had a significant positive effect on aggregate bilateral trade between Myanmar and its major trading partners. An increase in exchange rate volatility, which leads to higher risk, impacts trade flow negatively between Myanmar and its major trading partners. Moreover, the effect of GDP on trade was found to be positive and statistically significant, which is consistent with the prediction of the gravity model. However, the variable of distance between trading countries was not found to be significant, which suggests that the gravity mod-el does not strongly apply to the conditions in Myanmar. Because the distance between countries cannot well explain the trade flows be-tween Myanmar and its trading partners, apart from transportation costs, there may al-so be other important factors influencing trade, such as strong, economically and politi-cally dependent conditions related to China, which is Myanmar's largest trading part-ner in terms of trade flow and volume.

The findings in previous literature can be divided into three groups, establishing positive effects, negative effects and mixed effects between exchange rate volatility and trade flows McKenzie(1999) Some research-ers have also showed that exchange rate volatility has a negative impact on trade and that increasing the product of GDP of countries can increase trade flows between countries. This indicates that an increase in national income can foster trade by an increase in the purchasing power in a country Ozturk (2006). A limitation of the present paper is that it emphasizes only the trade flows between Myanmar and its major trad-ing partners, and not all trading countries.

6. Summary

Myanmar faces various policy mismanagement, and among them, the exchange rate policy is one of the significant which deter and distorts the country's economic performance. Therefore, the main purpose of this article has analyzed impact of the ex-change rate policy reform on aggregate bilateral trade flows of Myanmar and its major trading partners. In addition, the impact of exchange rate risk on trade flow between Myanmar and her major trading partners' countries. The trade flow model derived within the gravity framework and estimated by using panel data and its estimated results are highly significant.

The result of the study points out and suggest that the exchange rate policy reform in Myanmar can significantly explain the trade flow between trading countries and has positively

affects. This means that the policy reforms after 2011 can increase the trade between countries. Because, at that time the Myanmar authority did not only economic reforms but also political reforms in many different sectors. Among this plenty of re-forms, trade sectors reforms like trade liberalization and exchange rate policy reforms were remarkable. Therefore, the appropriate exchange rate policy reforms may in-crease the trade sector and hence stimulate the country's economic growth.

On the other hand, the exchange rate uncertainty and risk depress the trade be-tween countries. From these facts, one may conclude that the highly exchange rate risk is one of the important factors that can weaken the trade flow. The policies that can di-rectly improve foreign trade performance are one of the critical factors that can enhance the country's economic growth. Therefore, the policy road map to economic growth should also notice on reducing the exchange rate uncertainty problem.

Final point of the study is contemplation the condition in Myanmar with the con-cept of the gravity model. In the concept of the gravity model of trade, there is the higher transportation cost will reduce the trade volume and they have reverse direction in theory. However, in this study, the distance can't explain the trade significantly. This means that, other than the transportation cost there may have other factors that can strong influence on Myanmar bilateral trade with trading partners. Furthermore, if the trade partner countries is border with Myanmar it can explain trade between countries and statistically significant. The partner country is member of ASEAN is also one fac-tors that can encourage the volume of trade between countries. Additionally, the part-ner country is a higher income country that also can improve trade between countries. In concluding, as the same with the concept of Gravity model of trade, although the country's income level is positively effect on the trade between but the distance of the country cant's explain the trade significantly.

Chapter V

The Impact of Global and Major Trading Partners' Economic Policy Uncertainty (EPU) on Exchange Rate and Macroeconomic Performances of Myanmar

1. Introduction

Nowadays, the global economy is impacted by various uncertainties, such as economic policy, political, health crises, and environmental disasters. Economic policy and political uncertainty are more correlated with the decision makers of the economy and may find out how to eliminate this kind of uncertainty. Although the health and environmental crises can significantly impact the global economy, there are limitations to overcome from this kind of uncertainty. This article emphasized the Economic Policy Uncertain (EPU) on the economic performances of the specific economy. Economic Policy Uncertainty is the inability to predict future economic policies and the consequences of policies that the government has already adopted. EPU creates economic risk whether the government policy is uncertain and lead to increased risk premium and lead businesses and individuals to delay spending and investment. Uncertainty may have the significant effect on the economy positively or negatively. The importance of uncertainty in policies related to economic decision making is greater than time by time. It can learn the substantial changes in the economic environment, structures of the economy, and political and economic policies in the rest of the world by events of previous decades. This uncertain created the risk on economic environment for investment and resource allocation.

In 2016, Baker, Bloom, and Davis developed an index of EPU based on newspaper coverage frequency and showed that the EPU index proxies for movements in policy-related economic uncertainty. Since the financial crisis of 2008 and the following Great Recession, many scholars have begun to refocus on the impacts of economic policy uncertainty on economic activities. In global economic prospects, the number of the geopolitical events brought the high-risk economic policy uncertainty after the end of the financial crisis of 2008. Most of the researchers [22] established in the theoretical and empirical literature that highlight economic uncertainty has the potential to suffer economic activity throughout various channels, particularly through effects on household consumption and saving decisions, or on firms' investment and

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[22] Such as Guiso and Parigi (1999), Bloom 2009, Christiano et al. (2014) etc.

hiring decisions. Moreover, some authors23 assessed the effects of economic uncertainty in a number of different economies and showed that uncertainty shock impair the real GDP of the economy. Uncertainty about consumption and investment plans not only affects future investment decisions, but it also has a significant impact on developing countries' economic growth24.

When compare with the developed countries, the economic policy uncertainty is more prominent in the developing countries because of information failure, lowering production levels and lacking technological progress. Therefore, they have to depend largely on the policies and programs designed by developed countries and international financial institutions. Economic uncertainty occurs due to the disparity and discontinuity of government policies, which is worsened due to the inconsequential feedback from policymakers toward a changing economic and geopolitics environment and policy objectives. In recent times, the debate over EPU has become more important because the economic impact of these policies has changed since the 1970s, especially in developing countries. (Jun Wen, et al., 2022)

Myanmar is experiencing the significant and prominent highly uncertainty of political and economic policies environment extended with the pandemic of health crisis of Covid-19 and accumulated with the military coup crisis withing the whole country that shock hit the economy by deterioration of economic growth. This deterioration of economic growth has intensified the existing economic uncertainty and discontinuity of both political and economic decision making. Therefore, uncertainty is suffering Myanmar's economy due to its weak economic and political institutions and underdeveloped financial infrastructure. Furthermore, Myanmar, as a developing country, have to depend on external sectors both economic and political interest. Therefore, the economic policy uncertainty of external economy may have significant impact on the economic performance of Myanmar. Most of the existing research 25 find out the economic policy uncertainty of the given economy have significant impact on their own economy.

This study has contributed the existing literature on addition points of view of the external economies' policy uncertainty impact on the own economy. The small open and developing economy, like Myanmar, may have significant impact by economic policy uncertainty of the world and the countries have strongly political and economical related. There are less previous studies

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[23] Such as Arslan et al. (2015), Caggiano et al. (2017), Zalla (2017)
[24] See Pastor and Veronesi (2012)
[25] Such as (Moore 2017), Charles et al. (2018), Junchao Li et al. (2021), Jun Wen, et al. (2022), etc.

of other country economic policy uncertainty impact to home country. Most of the study explored how own country's economic policy uncertainty impact own countries' economic growth. These are the main motivated ideas to employ this research.

The major objective of this study is to evaluates the shock of global and major trading partners' economic policy uncertainty impact on Myanmar's economic performances and activities. This study employed the Vector Auto Regressive (VAR) approach to inspect the impact of economic policy uncertainty on Myanmar's economy by global EPU and major trading partners' EPU. The major trading partners in this study include China, Japan, United States, India, South Korea, Singapore, and Hong Kong according to their larger value of trade with Myanmar. The main finding of the study find that the global economic policy has a significant impact on the nation's industrial production, trade sector, and unemployment. The shock of global economic policy negatively impacts these three sectors compared to the other economic variables. Moreover, among the major trading partners, the economic policy uncertainty of China and Hong Kong has a more influential impact on Myanmar's economy, especially on the industrial and trade sectors. The shock of Hong Kong's economic policy uncertainty has fluctuated impact on industrial production and trade by time variance and has slightly shocked the country's unemployment.

The organization structure of this article comprise six sections. Section 1 is introduction of the study and brief review on global economic policy uncertainty and growth and review on the dependency of Myanmar economy on external sectors. Section 2 reviews the current relevant research literature both in the computing of economic policy uncertainty index and impact of this index on economic activities and economic growth. Section 3 explains the data and methodology of the analysis. The empirical finding of global and major trading partners' economic policy impacts are explained in section 4. Section 5 provides the conclusions and policy recommendation of the study. Finally, section 6 points out the limitation and further proceeding of the research.

1.1. The overview of Global Uncertainty and Growth

There are many uncertainties that impact the economic activities of the global economy such as grade economic depression, global financial crisis, US-China trade war, Global pandemic of Covid-19 crisis, Russia Ukraine conflict, etc. All of this uncertainty shocks are suffering the rest of the world on both developed and developing countries. Developing country may face more difficulties than developed countries because of weaknesses on political and economic intuitions,

technologies progress and power of resistance on the unexpected shocks. The following figure illustrate the global economic policy Uncertainty and economic growth of the overall economy.

Figure-1: Global Economic Policy Uncertainty and GDP Growth Rate

(a) Global EPU Index   **(b) Global GDP Growth Rate**
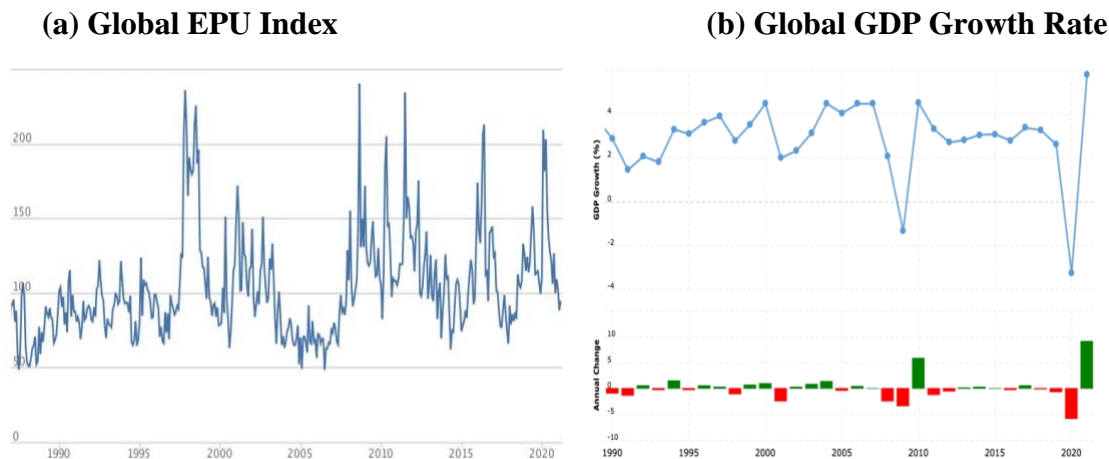
Source: Economic Policy Uncertainty Index[26] and Macrotrends[27]

Figure 1 illustrates the global economic policy uncertainty index and the trend of global economic growth between 1990 to 2020. During this period the global economy faced two significant and noticeable finical crises. First crisis was happened in 1997-1998 and started from Thailand and it became a global crisis and it spread to the Russian and Brazilian economy. That crisis well known as Asian and Russian Financial Crisis[28], and it slightly impact the global economy compare the second financial crisis. Second financial crisis was started from mid 2007 and end early 2009 and it started from the US financial stresses peaked by following the failure of the US financial firm. That crisis spread all around the world through linkages in the global financial system and many banks around the world suffered huge losses and millions of people lost their jobs as the major advanced economies experienced their deepest recessions. That crisis well known as Global Financial Crisis[29] and suffered the significant depress in the global economic growth as show in figure b. The economic downturn during 2000 to 2003 may have influence

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[26]Can see more specifically at https://www.policyuncertainty.com/
[27]Can see more specifically at https://www.macrotrends.net/countries/WLD/world/gdp-growth-rate
[28]Can see more specifically at https://www.britannica.com/event/Asian-financial-crisis
[29] https://www.rba.gov.au/education/resources/explainers/the-global-financial-crisis

effect of 9/11 attacked[30] of world trade center in united states in 2001 and Gulf War 2[31] of conflict in Iraq in 2003. Finally, the most prominent global economic downturn around 2020 have significant impact because of health crisis of global pandemic of covid 19 and Russia Ukraine conflict by recent research[32]. According to the figure-1 (a) and (b), can generally depict that the global economic policy uncertainty and global economic growth go with the opposite trend, in other words, when it is increase in global economic policy uncertainty, it stresses the global economic growth to downturn.

Figure-2: Compare the Global and Major Trading Partners' EPU index
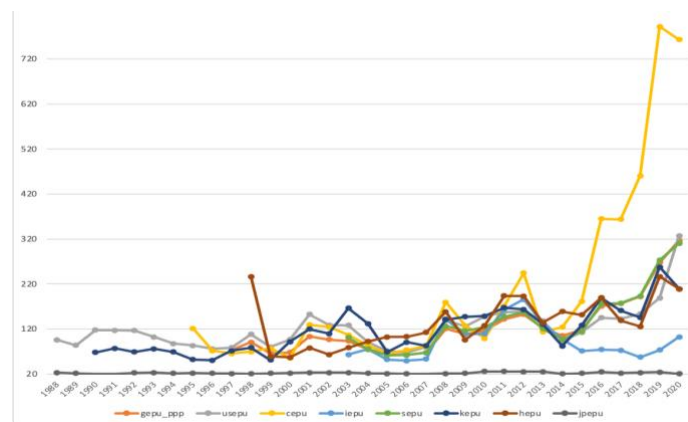
Source: Economic Policy Uncertainty Index[33]

Among the economic policy uncertainty of major trading partners of Myanmar, the China has highest EPU index and Japan has lowest EPU index. The trend of Singapore and US EPU indices go similar pattern the EPU index of South Korea and Hong Kong go nearly the same trend. Among all EPU index the Japan's EPU index is significantly stable during the study periods. For the same points, all countries and global EPU index are increase during the time of 2019 and 2020.

1.2. The Degree of Dependence of Myanmar Economy on External sectors

This study emphasis on the influence of external uncertainty on the Myanmar's economy by analyzing on the evident of global and major trading partners' EPU index. In this section

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[30] https://www.britannica.com/event/September-11-attacks
[31] https://www.britannica.com/event/Iraq-War
[32] AÇIKGÖZ et al. (2020), Byomakesh et al. (2020), Mbah, R. E., & Wasum, D. F. (2022)
[33] https://www.policyuncertainty.com/

represent the degree of dependence on external sector of the country by three different sectors: percent of trade sector in GDP; net inflow of Foreign Direct Invest; and burden of external debt.

Figure-3: Contribution of Trade sector in Myanmar's GDP
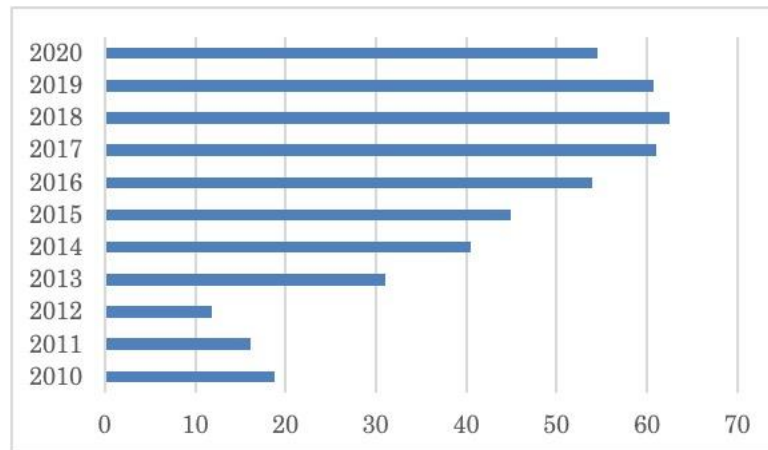
Source: World bank[34]

Figure 3 shows the percent of trade sector in gross domestic product of Myanmar from 2010 to 2020. For one decade, the trade sector of Myanmar dramatically increases year by year. After 2015 the Myanmar's GDP depend on trade sectors over 50% of GDP and it reached over 60% after 2016. This can express as one factors that depict the dependence of Myanmar's economy on the external sector. Therefore, the economic policy uncertainty of Myanmar's trading partners' may influence on her economic performances.

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[34]Can access the data at https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS

Figure-4 Direction of Export and Impart by Major Country/Region

(a) Export Direction   *(b) Import Direction*
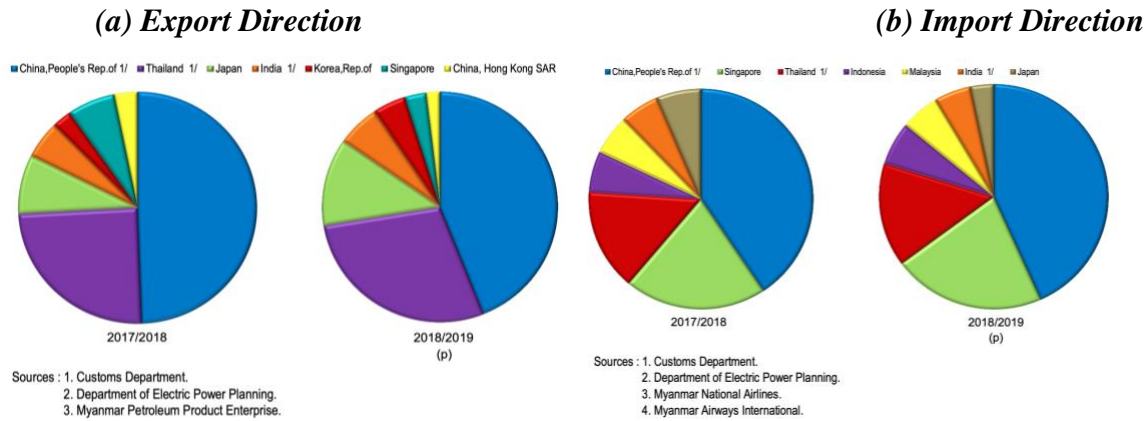
Source: Statistical Year Book, Central Statistical Organization, 2019

Among major trading countries, China has the largest trade share with Myanmar in both Export and Import direction. The second largest trading country is Thailand in export direction and Singapore in import direction respectively. The different of trading sharing may influence on Myanmar's with the different weight of EPU index.

Figure-5: Share of FDI and External Debt Stocks

(a)   (b)

Source: World Bank[35]

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[35](a) https://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS
   (b) https://data.worldbank.org/indicator/DT.DOD.DECT.GN.ZS
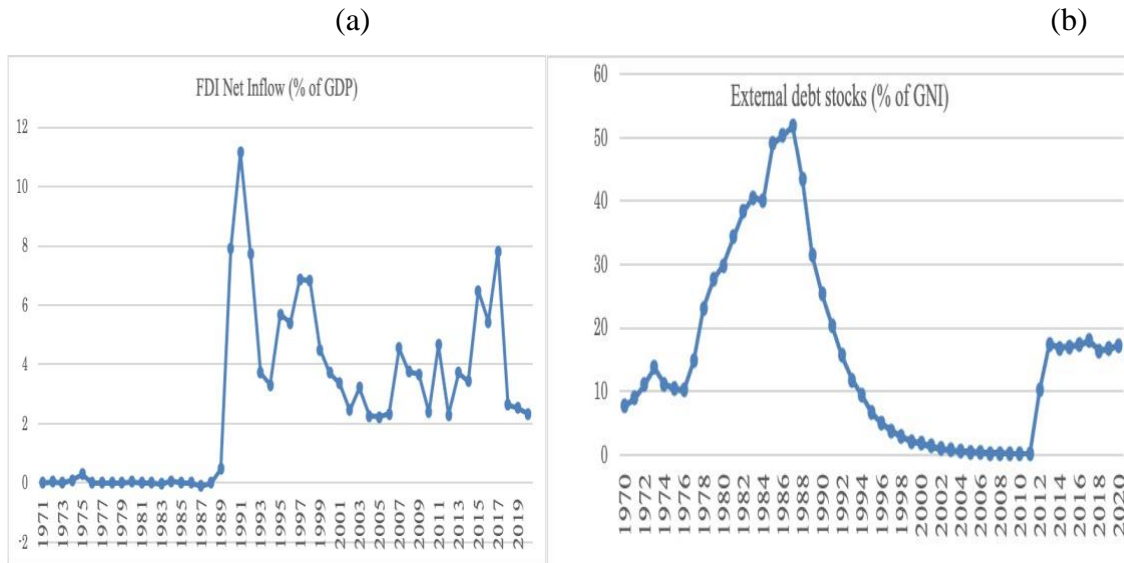
Figure 5 (a) show the share of foreign direct investment inflow to Myanmar by percentage of GDP increase during 1989 and flatulate during the study period. Foreign investment decision may influence bout home country and host country economic policy uncertainty. But in this study focuses on the external policy influence on investment decision on Myanmar. Moreover, external debt stocks is analyse to explain how Myanmar economy depend on the external sector. It reaches over 50 % in the middle of 1980s and decrease nearly zero after 2000 and increase again after 2010 up to 20% only. Burden of external debt is also a factor that can see the dependent of the economy on the external sectors.

2. Literature Review

Several papers, in particular, Baker, Bloom and Davis (2013) and Bhagat and Obreja (2013) , have provided evidence that increase in the economic policy uncertainty has played a significant role in the slow-down and the increase in unemployment in the U.S. A strand of research proposes that sudden jumps in uncertainty generate rapid drops and recoveries in real macroeconomic variables that drive the business cycle. (Fontaine et al., 2013) The terms economic policy uncertainty (EPU) is the inability to predict future economic policies and the consequences of policies that the government has already adopted, creating, and increasing risk to economic activities and leading businesses and individuals to delay spending and investment.

Bhagat (2013) analyzed Economic Policy Uncertainty and Economic Growth in India and the study point out Indian GDP and fixed investment are negatively related to EPU and according to the empirical result decrease in EPU in 2005 encourage India's GDP growth increase by 0.56% and fixed investment growth would increase by 1.36%. Swallow and Cespedes (2013) investigated the impact of uncertainty shocks in emerging economies by using Standard specification for the reduced-form VAR. That study point out, emerging economies much more suffer by fall in investment and private consumption and following an exogenous uncertainty shock and take significantly longer to recover when compared to the United State and other developed countries. In developed economies, there is no significant reaction of private consumption to uncertainty shocks but in emerging economies display a large drop of this variable.

Sahinoz et al.,(2018) investigated how the impact of economic policy uncertainty on economic activity and that study reveals that policy uncertainty has adverse impacts on economic growth, consumption and investment in Turkey by employing VAR model. The remarkable point

is that high uncertainty leads to a greater investment decline than output and consumption. Ren (2019) examined the effects of economic policy uncertainty on China's economy and the study find out the EPU shocks have a significant and negative impact on economic growth, consumption, exchange rates, bonds and the stock market, but showing a positive impact on credit, real estate and fixed asset investment (which might be due to China's special economic market environment and the high investment return).

Most of the existing studies illustrates the irelationship between EPU and macroeconomic variables of their interest. according to the Baker et al. in 2016, a vital component of the monthly EPU index is counting newspaper articles containing keywords related to policy uncertainty. Moreover, economic policy uncertainty could serve as a representative of expectations made by investors concerning the government's response to economic crises. In this context, a high level of economic policy uncertainty may express a lack of confidence in the capabilities of the government at a time when decision-making is threatened in the economy . Dakhlaoui et al. 2016 and concerns about the future effect of unforeseen policies or regulations regarding business performance (Kang et al. 2014. The EPU poses a significant irreversible risk to individual investors and predicts negative economic consequences Brogaard et al. 2015. Many empirical studies proved that EPU has a significant impact on macroecomoic economy and financial growth performance.

3. Data and Methodology

3.1. Data Descriptions

This section explains the variables used and a methodology that has the potential to evaluate the response of economic activity to uncertainty. The GEPU index measures global economic policy uncertainty, and MEPU measures the major trading partners' economic policy uncertainty. The policy related economic uncertainty, EPU index[36] , is constructed by three types of underlying components: the newspaper-based approach is used for the majority of country; the number of federal tax code provisions and index draws on reports by the Congressional Budget Office (COB) used for the United States; and the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters (Baker et al. 2016). There are two versions of the GEPU Index: based on current-price GDP measures, and on Purchasing Power Parity (PPP) adjusted GDP. In this analysis used the PPP-adjusted version of GEPU to explore the real impact on the economy.

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[36] EPU indices can acquire at http://www.policyuncertainty.com/.

Moreover, CEPU, JEPU, HEPU, KEPU, IEPU, SEPU and USEPU are the major trading countries with Myanmar such as China, Japan, Hong Kong, South Korea, India, Singapore and United Stated respectively.

In this study, the industrial production of Myanmar is described by *INDUSPRO* and this variable is used for the proxy of economic growth. EXRATE is the real exchange rate MMK/US$. UNEMP is stand for unemployment rate of the economy. All the variables employed in this analysis used yearly time series data for the period from 1988 to 2020 and all variables are defined in real terms.

Table 1: Descriptive Statistics of the variables

Variable	Obs	Mean	St. Dev	Min	Max	Skewness	Kurtosis
INDUSPRO	31	4608947	6623512	5409	2.02e+07	1.160698	2.810395
EXRATE	33	737.6044	497.7777	43.53	1519.542	-.156841	1.515704
UNEMP	30	.8933667	.2862364	.687	1.711	1.987851	5.283273
TRADE	31	3208102	4099456	10558.2	1.18e+07	.9245185	2.246715
GEPU	24	123.5683	64.1741	61.98728	316.4223	1.583635	5.14524
CEPU	26	196.4297	199.6186	55.68742	791.8737	2.046213	6.228332
JEPU	33	22.05144	1.713248	19.68551	25.78711	.6467644	2.551803
HEPU	23	134.345	55.09648	56.52612	236.345	.3618049	2.075759
KEPU	31	115.7872	51.36985	50.19894	257.3615	.751473	3.057287
IEPU	18	93.32011	40.15233	49.48257	185.4646	.90329	2.792141
SEPU	18	138.7334	68.44077	61.40801	310.0482	1.136347	3.741316
USEPU	33	120.8447	48.21927	67.13629	326.98	2.398965	11.14063

Source: Economic Policy Uncertainty Index[37], Myanmar Statistical Information Services[38]

3.2. Identification of the Model

This study employed the Vector Auto Regressive (VAR) Models to verify the global and major trading partners' economic policy uncertainty on economic performances of Myanmar. Moreover, compare the major significant impacts of difference countries due to their different level of uncertainty and level of relationship with Myanmar. VAR models are not estimated to yield

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[37] https://www.policyuncertainty.com/index.html
[38] https://www.mmsis.gov.mm/sub_menu/statistics/fileDb.jsp

advice on the best monetary policy but it can use to estimate to provide empirical evidence on the response of macroeconomic variables to economic policy uncertainty impulses in order to discriminate between alternative theoretical models of the economy (Favero, 2001). VAR models allow to control for the possible endogeneity of the uncertainty indicators by further including lags of the variable of interest in the system analysis. In this study consturted the VAR model based on the previous literatures such as Baker et al. (2016), Jurado et al. (2015) and Ogawa and Luo (2020). This analysis examines impulse responses of major macroeconomic indicators of Myanmar to the one standard deviation shock on the global and major trading partners' economic policy uncertainty index. To acquire the objectives of the analysis, there are two kinds of model constructed in this study: Model I is conduct to explore the global uncertainty impacts and Model II is operate to examine the impact of major trading country economic policy risk.

Model I: Impact of Global Economic Policy Uncertainty

$$\begin{pmatrix} INDUSPRO_t \\ GEPU_t \\ EXRATE_t \\ UNEMP_t \\ TRADE_t \end{pmatrix} = \begin{pmatrix} \propto_1 \\ \propto_2 \\ \propto_3 \\ \propto_4 \\ \propto_5 \end{pmatrix} + C(L) \begin{pmatrix} INDUSPRO_{t-1} \\ GEPU_{t-1} \\ EXRATE_{t-1} \\ UNEMP_{t-1} \\ TRADE_{t-1} \end{pmatrix} + \begin{pmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \\ \mu_{5t} \end{pmatrix} \qquad (1)$$

Model II: Impact of Major Trading Partners' Economic Policy Uncertainty

$$\begin{pmatrix} INDUSPRO_t \\ MEPU_t \\ EXRATE_t \\ UNEMP_t \\ TRADE_t \end{pmatrix} = \begin{pmatrix} \propto_1 \\ \propto_2 \\ \propto_3 \\ \propto_4 \\ \propto_5 \end{pmatrix} + C(L) \begin{pmatrix} INDUSPRO_{t-1} \\ MEPU_{t-1} \\ EXRATE_{t-1} \\ UNEMP_{t-1} \\ TRADE_{t-1} \end{pmatrix} + \begin{pmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \\ \mu_{5t} \end{pmatrix} \qquad (2)$$

In equation (1) and (2) $INDUSPRO_t$ is industrial production, $GEPU_t$ is global economic policy uncertainty, $EXRATE_t$ is real exchange rate, $UNEMP_t$ is unemployment rate and $TRADE_t$ implies the ratio of export to total trade by calculating export divided by summation of export and import in given year. $\propto_i$ is the constant terms an *C(L)* is the lag operator and μ_{it} is the error term. This error term in VAR model can also know of the one standard deviation shock of the system. $MEPU_t$ in equation 2 is represent the major trading partners' economic policy uncertainty. In Model B: to explore the different country impact on Myanmar economy replace the seven

countries' policy uncertainty index to examine the specific impact of each country, when running the Model II.

In summarizing, the Model I is employed to verify the global policy uncertainty effect and Model II is to validate the impact of major trading countries' policy uncertainty impact on macroeconomic performance of Myanmar by using the macroeconomic indicators of Myanmar. Higher in both global and trading countries economic policy uncertainty may lead to the recessionary effect as a developing country with large dependence on external sectors. The expected direction of these policy uncertainty can clarify in Table (1).

Table 1: Expected Sign of Responses

		Response by Myanmar Economy			
		INDUSPRO	EXRAT	UNEMP	TRADE
One	GEPU	-	+	+	-
Standard	CEPU	-	+	+	-
Deviation	JPEPU	-	+	+	-
Shock	HEPU	-	+	+	-
	IEPU	-	+	+	-
	SEPU	-	+	+	-
	USEPU	-	+	+	-
	KEPU	-	+	+	-

The negative sign of industrial production indicates harmful effect on the Myanmar's economy by decreasing output growth. The positive sign of exchange rate means the currency of Myanmar's kyats (MMK/US$) is increasing. On the other words, it means depreciation of Myanmar currency. This may force and stimulate domestic price like a country Myanmar that have to import not only capital goods and fundamental goods such as raw material, foods and clothes etc. Finally, the negative sign of trade means decreases in export ratio to total trade.

4. The Empirical Analysis on the Impact of the Economic Policy Uncertainty

In this section, the empirical analysis by using the Model I and II that identified in section 3. Firstly, to know the stationary of the time series data used ADF test and the results shown in table 2.

**Table 2: Augmented Dickey-Fuller test for unit root**

Variable	ADF Test statistics	Critical value at 5%	p-value for z(t)	Results
GEPU	-3.338	-3.000	0.0133	Stationary
CEPU	-4.658	-3.000	0.0001	Stationary
JPEPU	-5.503	-2.983	0.0000	Stationary
USEPU	-3.085	-2.983	0.0276	Stationary
KEPU	-6.418	-2.989	0.0000	Stationary
IEPU	-3.639	-3.000	0.0051	Stationary
SEPU	-3.121	-3.000	0.0250	Stationary
HEPU	-7.200	-3.000	0.0000	Stationary
EXRATE	-4.122	-2.983	0.0009	Stationary
CPI	-3.209	-2.983	0.0195	Stationary
INDUSPRO	-4.567	-2.989	0.0001	Stationary
UNEMP	-3.470	-2.992	0.0088	Stationary
TRADE	-2.645*	-2.989	0.0841*	Stationary

Source: Calculation, at first difference
Note: * significant at 10% level, the rests significant at 5% level

4.1. The impact of Global Economic Uncertainty on Macroeconomic Performance in Myanmar

The estimation result of Model I point out, the shock of global economic policy uncertainty depresses the industrial production of the Myanmar's economy significantly. In addition, the exchange rate also decreases by increasing in global economic shock. This mean Myanmar face currencies depreciation and it may force to increase the price of domestic goods throughout increase in the imported raw materials may push the cost of production. This impact may induce to increase the unemployment rate of the economy. But the result of global economic policy shock insignificant on the unemployment of the economy. Therefore, the shock of global economic policy uncertainty inversely on both industrial production and exchange rate and less influence on the unemployment with the 5 % significant level.

Figure – 6 : Impulse Response of Global EPU to Myanmar Economy

Note: Shaded Area mean 95% Confidence Interval

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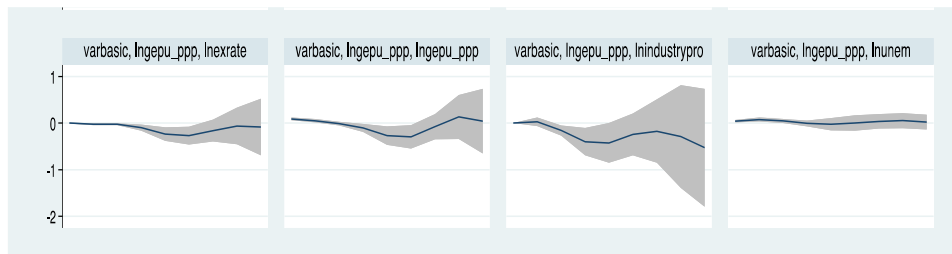
4.2. The impact of Major Trading Partners' Economic Uncertainty on Macroeconomic Performance in Myanmar

Among all of the majors trading partners, the economic policy uncertainty of China impact on Myanmar economy more than other trading countries. Similarly global uncertainty shock, the China's economic policy uncertainty shock impact more on industrial production and exchange rate negative and has low influence on the unemployment level of the economy of Myanmar. Moreover, it also has significant downturn impact on the export ratio of trade. China is one the largest trading partner with Myanmar among trading partner as shown in in both direction of export and import channel as shown in figure 4. Therefore, the policy uncertainty of China's may have a strong and fast influence on Myanmar economy. For obvious example, in recent crisis of covid-19, many unexpected decisions making on border trade created huge policy risk for Myanmar and it's suffer most of the agricultural products exporters of Myanmar and create enormous losses on trade composition of Myanmar.

The Japan's economic policy is the most stable EPU among all countries in this study as depicted in figure 2. The policy uncertainty shock of Japan has no significant impact on the Myanmar economy. Among the macroeconomic indicators of Myanmar, it has slight impact on industrial production only.

The Hong Kong also has the strong economic impact on Myanmar economy especially on the industrial production. At the first period of time although it has positive impact, after the time lags and time difference, the impact turn to the negative impact on the industrial production an unemployment rate.

The Singapore and India economic policy uncertainty impact on the Myanmar economy after time lag through industrial production and unemployment. The shock of India's EPU has no significant impact on the short term and after time difference it have negative impact on both production and unemployment. Similarly, Singapore' EPU also have same trend of impact with India's EPU. But the weight and magnitude India EPU is slightly larger than Singapore EPU.

The US and Korea economic policy uncertainty has few impacts on the economy of Myanmar. The shock of US and Korea EPU is not significant on unemployment of the Myanmar economy. Although the US is one of the powerful economic and political power, the dependence burden of Myanmar economy is more on the other external economy like China, therefore, the

increase in shock of US economic policy uncertainty can influence low level on Myanmar Economy (See Appendix 10)

Table 3: Summary of the Responses of Myanmar Economy to the Economic Policy Uncertainty

		Response by Myanmar eonomy							
		INDUSPRO		EXRAT		UNEMP		TRADE	
		1st TP	After time lag	1st TP	After time lag	1st TP	After time lag	1st TP	After time lag
One Standard Deviation Shock	GEPU (4)	- *	+ *	- *	+ *	+ *	+ *	- *	- *
	CEPU (4)	- *	+ *	- *	- *	- *	+ *	- *	+ *
	JPEPU (3)	+	-	+ *	+	+ *	+**	+ *	- *
	HEPU (4)	+ *	- *	- *	- *	- *	+ *	+ *	-*
	IEPU (4)	- *	+ *	+ *	- *	+ *	- *	- *	+ *
	SEPU (3)	- *	- *	+ *	+ *	+ *	- *	- *	- *
	USEPU (4)	+ *	- *	-	+ *	+	+	+ *	- *
	KEPU (3)	+ **	+ *	- *	- *	+	-	+ **	+ *

Note: * = significant at 5 % level, ** = significant at 10 % level,
(3) and (4) = numbers of time lags, TP = Time Period

5. Summary

In recent times, the economic crisis caused by the global coronavirus epidemic has suffered most economy through decreased production and created unemployment, especially in underdeveloped countries with no technology and poor infrastructure to run online-based business and educational activities. Ghirelli et al. (2021) analyzed the spillover effects of economic policy uncertainty in Latin America has significantly dampening commercial relationships between Spain and LA countries and decreasing export and foreign investment of Spain in LA. Sahinoz et al. (2018) investigated that EPU has adverse impacts on economic growth, consumption, and investment in Turkey and that high uncertainty leads to a more significant investment decline than output and consumption. This study is motivated by two ideas. Firstly, the small open and developing economy, like Myanmar, that have highly dependent on the external sectors, may significantly impact by the economic policy uncertainty of the world and the EPU of countries

which has strong political and economic relationships. Second, there are fewer previous studies on other countries' economic policy uncertainty impact on home country, and most of the study explored how own country's economic policy uncertainty impact own countries' economic activities. The objectives of this analysis have two-fold; first, it explores how global risk affects Myanmar's economic activities, and second, it examines the influence and impact of major trading partners' EPU on the macroeconomic performance of Myanmar and which countries' EPU impact more prominent on her economy. The study employed the vector autoregressive model, and the main finding shows that the global economic policy uncertainty significantly impacts the nation's industrial production, trade sector, and unemployment. The shock of global economic policy negatively impacts these three sectors compared to the other macro indicators. Moreover, among the major trading partners, the economic policy uncertainty of China and Japan has a more influential impact on Myanmar's economy, especially on the industrial and trade sectors. The shock of Japan's economic policy uncertainty has fluctuated impact on industrial production and trade by time variance and also has slightly shocked and suffer the country's unemployment condition. In addition, China's economic policy uncertainty positively impacts the country's consumer price index, exchange rate, and unemployment. And then also harms the country's industrial production and trade sector. By concluding these empirical results, the economic policy uncertainty of both global and major trading partners impacts adversely on crucial macroeconomic performance of Myanmar, and through those impacts, it may suffer the economic growth of Myanmar by these policy uncertainties.

This study examined the global economic policy uncertainty and major trading partners' economic policy uncertainty on macroeconomic performance of Myanmar by employed VAR model. The analysis points out that the global economic policy has a significant impact on the nation's industrial production, trade sector, and unemployment. The shock of global economic policy negatively impacts these three sectors compared to the other economic variables. Moreover, among the major trading partners, the economic policy uncertainty of China and Hong Kong has a more influential impact on Myanmar's economy, especially on the industrial and trade sectors. The shock of Hong Kong's economic policy uncertainty has fluctuated impact on industrial production and trade by time variance and has slightly shocked the country's unemployment. In addition, China's economic policy has a positive impact on exchange rate, and unemployment of the country. And then it harms the country's industrial production and trade sector. By concluding

these empirical results, the economic policy uncertainty of both global and major trading partner impact adverse on important macroeconomic indicator of Myanmar and throughout those impact of global and external economies policy uncertainty may obstacle to approach the economic growth path and harmful on the economic growth of the country, Myanmar.

The major limitation of this study is to compute own country's economic policy uncertainty. In generally, it can imagine, there are many kinds of uncertainty is outbreak in Myanmar in several area such as political uncertainty in both military coup and historical ethnic groups conflict, moreover, arising People Defense Force also known as PDF Army economic. In addition, also economic policy and failure financial institutions and structural depress the economy until to the failure state, estimated by various scholar. Because of lack of reliable data source, technical inefficient and others weakness, this study couldn't compute Myanmar's EPU index. Therefore, in future it generates the interesting idea for researchers to proceed the measurement of Myanmar's Economic Policy Uncertainty Index and compare how suffer the political and economic policy uncertainty with what magnitude on the own country economic performances.

Chapter VI
Conclusions and Discussions

This research analyzed the effect of exchange rate policy on macroeconomics performance of Myanmar especially focus on how its impact on the economic growth of Myanmar and international trade of the country over the period of 1988 to 2022. The period of study fragments into four noticeable distinctions of government era- under the military government era, new civilian government era, new democratic government era and military coup of 2021. The study divided four main analyses to explain the impact more concretely. In the first analysis explored the rechange rate reforms and economic growth and the second analysis find out the exchange rate and trade balance of the country. Moreover, to analyze more deeply the third analysis examined the risk of exchange rate and trade flows of the country.

In the very first parts of the study analyzed the macroeconomics performances of Myanmar under the different government era. The study reviewed the exchange rate policy reforms of Myanmar in this different government ear and examine the impact of these policy reforms on the economic growth of the country. The management of the exchange rate is one of the major policy objectives in Myanmar to achieve a set of diverse objectives of economic growth, containment of inflation, and maintenance of external competitiveness. In the long run there is a positive association between the real exchange rate and economic growth and inflation has a negative pressure on growth. Therefore, the exchange rate policy reforms in 2012 were pivotal in considering as a development strategy of the country, but the plausible of increasing inflationary pressure needs to be taken into account while adopting this policy option. This study finds that in the long run, the real exchange rate has a positive impact while inflation debilitates the real GDP growth rate of Myanmar. However, the real exchange rate has no short-term dynamic impact on the real GDP growth of Myanmar. In addition, the 2011 CBM policy reform of the exchange rate do have significant impact on the country's growth rate. Therefore, the policy reforms provide the positive effect in the leading of sustainable growth with price stability. However, Myanmar as a developing country, although this exchange rate policy has an expansionary effect on economic growth, it still needed to review and reforms other sector which can accelerate the economic growth of the country.

The second analysis was examined and find out the impact of exchange rate on trade balance of Myanmar over the period of 1986-2015 primarily with the empirical analysis and general descriptive statistics. The data set employed in this study is secondary data of trade balance , Export and Import. These three variables were used into value in US dollar million term and market exchange rate, and the official exchange rate of Myanmar during the period 1986-2015 were used into kyat per dollar term, respectively. The second study adopted the Switching Regression molel and empirical results found exchange rate has significant impact on the trade balance of Myanmar. Exchange rate does have positive impact on trade balance in the long-run indicating that a depreciation can lead to improvement of trade balance and an appreciation can lead to deterioration of trade balance. But in Myanmar after 2011, although the exchange rate depreciated the trade balance did not improve at that year and the trade balance face deficit.

The third analysis explored impact of the ex-change rate policy reform on aggregate bilateral trade flows of Myanmar and its major trading partners. In addition, the impact of exchange rate risk on trade flow between Myanmar and her major trading partners' countries. The trade flow model derived within the gravity framework and estimated by using panel data and its estimated re-sults are highly significant. The result points out and suggest that the exchange rate policy reform in Myanmar can significantly explain the trade flow between trading countries and has positively affects. This means that the policy reforms after 2011 can increase the trade between countries. Because, at that time the Myanmar authority did not only economic reforms but also political reforms in many different sectors. Among this plenty of re-forms, trade sectors reforms like trade liberalization and exchange rate policy reforms were remarkable. Therefore, the appropriate exchange rate policy reforms may in-crease the trade sector and hence stimulate the country's economic growth.

On the other hand, the exchange rate uncertainty and risk depress the trade be-tween countries. From these facts, one may conclude that the highly exchange rate risk is one of the important factors that can weaken the trade flow. The policies that can di-rectly improve foreign trade performance are one of the critical factors that can enhance the country's economic growth. Therefore, the policy road map to economic growth should also notice on reducing the exchange rate uncertainty problem. In the concept of the gravity model of trade, there is the higher transportation cost will reduce the trade volume and they have reverse direction in theory. However, in this study, the distance can't explain the trade significantly. This means that, other than the

transportation cost there may have other factors that can strong influence on Myanmar bilateral trade with trading partners. Furthermore, if the trade partner countries is border with Myanmar it can explain trade between countries and statistically significant. The partner country is member of ASEAN is also one fac-tors that can encourage the volume of trade between countries. Additionally, the part-ner country is a higher income country that also can improve trade between countries. In concluding, as the same with the concept of Gravity model of trade, although the country's income level is positively effect on the trade between but the distance of the country cant's explain the trade significantly.

In recent times, the economic crisis caused by the global coronavirus epidemic has suffered most economy through decreased production and created unemployment, especially in underdeveloped countries with no technology and poor infrastructure to run online-based business and educational activities. The final analysis explores how global risk affects Myanmar's economic activities and the influence and impact of major trading partners' EPU on the macroeconomic performance of Myanmar and which countries' EPU impact more prominent on her economy. The study employed the vector autoregressive model, and the main finding shows that the global economic policy uncertainty significantly impacts the nation's industrial production, trade sector, and unemployment. The shock of global economic policy negatively impacts these three sectors compared to the other economic variables. Moreover, among the major trading partners, the economic policy uncertainty of China and Hong Kong has a more influential impact on Myanmar's economy, especially on the industrial and trade sectors. The shock of Hong Kong's economic policy uncertainty has fluctuated impact on industrial production and trade by time variance and has slightly shocked the country's unemployment. In addition, China's economic policy has a positive impact on exchange rate, and unemployment of the country. And then it harms the country's industrial production and trade sector. By concluding these empirical results, the economic policy uncertainty of both global and major trading partner impact adverse on important macroeconomic indicator of Myanmar and throughout those impact of global and external economies policy uncertainty may obstacle to approach the economic growth path and harmful on the economic growth of the country, Myanmar.

In summarizing Myanmar faces various policy mismanagement, and among them, the exchange rate policy is one of the significant factors which deter and distorts the country's economic performance. The conclusion from this study shows that the liberalization and

unification of the exchange rate policy reforms were gainful to Myanmar's economy as they promote the steady growth of the economy.

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Appendixs

Appendix 1. Real GDP, Per Capita GDP, and Growth Rate (1988-2021)

	Year	Real GDP (constant 2015 US$ mil)	Real GDP growth (annual %)	GDP per capita (constant 2015 US$)	GDP per capita growth (annual %)
Under Military Rule	1988	7709.78	-7.60	192.33	-9.17
	1990	7619.41	3.25	184.33	1.74
	1995	9925.37	7.20	226.08	5.94
	2000	14481.50	**12.42**	309.97	11.12
	2005	26541.59	**13.57**	542.22	12.67
	2010	45669.36	10.07	902.54	9.31
New Initial Civilian Government	2011	49103.73	7.52	963.00	6.70
	2012	52288.47	6.49	1017.01	5.61
	2013	56418.57	7.90	1088.06	6.99
	2014	61044.70	8.20	1167.63	7.31
	2015	63045.31	3.28	1196.74	2.49
New Democratic Government	2016	69669.97	10.51	1313.41	9.75
	2017	73676.04	5.75	1380.15	5.08
	2018	78394.97	6.40	1459.64	5.76
	2019	83686.99	6.75	1548.46	6.08
	2020	86343.03	3.17	1586.90	2.48
Military Coup of 2021	2021	70814.46	-17.98	1292.09	-18.58

Source: World Bank Data[39]

Appendix 2. Official and Market Exchange Rate of Myanmar from 1988 to 2022

(MMK per US $)

Year	Market Exchange Rate	Official Exchange Rate
1988	43.53	6.4
1989	53	6.7
1990	62	6.3
1991	88	6.3
1992	105	6.1

[39] https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG

1993	119	6.2
1994	113.4	6.0
1995	120.4	5.7
1996	159.1	5.9
1997	340	6.2
1998	343.2	6.3
1999	348	6.3
2000	376.42	6.5
2001	616.07	6.7
2002	921.14	6.6
2003	966.57	6.1
2004	988.57	5.8
2005	1060.27	5.8
2006	1270.38	5.8
2007	1272.17	5.6
2008	1045	5.4
2009	1063.6	5.6
2010	973.4	5.6
2011	980	5.4
2012	859.66	640.7
2013	967	933.6
2014	987.25	984.3
2015	1161.75	1162.6
2016	1238.58	1234.9
2017	1359.71	1360.4
2018	1433.46	1429.8
2019	1519.54	1518.3
2020	1385.77	1381.6
2021	1720	1619
2022	2011	1799

Source: Central Bank of Myanmar, Various Foreign Exchange Brokers at Shwe Bon Thar Street

Yangon

Appendix 3. Contribution of Trade Sector in GDP

Year	Trade (% of GDP)	Exports of goods and services (% of GDP)	Imports of goods and services (% of GDP)
2010	18.80	10.62	8.18
2011	16.13	9.10	7.03
2012	11.86	6.09	5.77
2013	30.98	15.82	15.16
2014	40.53	19.88	20.65
2015	44.95	20.46	24.48
2016	53.92	22.98	30.94
2017	61.02	25.94	35.08
2018	62.45	28.36	34.09
2019	60.69	30.39	30.30
2020	55.10	28.65	26.45
2021	53.15	28.32	24.83

Source: World Bank Data[40]

Appendix 2. Export Import and Trade Balance

	Year	Export (US $ Million)	Import (US $ Million)	Balance of Trade (US $ Million)	Trade Deficit/Surplus as a % of Import
Under Military Rule	1988	219.00	268.00	-49.00	-18.28
	1990	215.00	201.00	14.00	6.97
	1995	917.00	1488.00	-571.00	-38.37
	2000	1309.00	2355.00	-1046.00	-44.42
	2005	2869.86	1948.83	921.03	47.26
	2010	7327.53	4052.86	3274.67	80.80
New Initial Civilian Government	2011	1627.63	1177.92	449.72	38.18
	2012	9135.60	9035.10	100.50	1.11
	2013	8977.00	9068.90	-91.90	-1.01
	2014	11204.00	13759.50	-2555.50	-18.57

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[40] https://data.worldbank.org/indicator/NE.IMP.GNFS.ZS, https://data.worldbank.org/indicator/NE.EXP.GNFS.ZS, https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS

	2015	12523.00	16633.20	-4110.20	-24.71
New Democratic Government	2016	11136.90	16577.90	-5441.00	-32.82
	2017	11951.60	17211.10	-5259.50	-30.56
	2018	14850.70	18687.00	-3836.30	-20.53
	2019	8832.20	9858.00	-1025.80	-10.41
	2020	17060.40	18086.60	-1026.20	-5.67
Military Coup of 2021	2021	16595.40	16156.60	438.80	2.72
	2022	11854.8	11325.2	4.68	2022

Source: Myanmar Statistical Year Books, Selected Monthly Economic Indicators 2022

Appendix 3. Exports and Imports Composition by Commodities Under Different Government Era (US $ Million)

Year	1996	2006	2013	2017	2022
Agricultural	45.93	12.23	13.87	11.83	25.63
Marine	12.15	5.54	4.16	1.87	5.32
Mineral	2.79	6.55	0.13	1.29	3.71
Timber	20.85	13.46	6.39	0.99	0.90
Gas	0.00	30.35	40.84	36.34	0.00
Manufacture	5.91	7.64	7.74	7.17	50.55
Other	12.37	24.23	26.87	40.51	13.89
Total Exports	**897**	**3558**	**8977**	**11952**	**11854.8**
Capital Goods	35.38	27.64	37.48	30.51	18.82
Intermediate Goods	23.07	32.17	29.49	37.94	48.16
Consumer Goods	41.55	40.19	33.03	40.91	33.02
Total Imports	**1831.9**	**1984.4**	**9068.9**	**17211.1**	**11325.2**

Source: Myanmar Statistical Year Books, Selected Monthly Economic Indicators 2022

Appendix 4. Permitted Foreign Direct Invest (FDI) by Sector Under Military Rule in First Phase (Absolute Values in US $ Million)

Sector	1997	1998	1999	2000	2001
Agriculture	6	5.7	0	0	20
Livestock & Fisheries	17.5	5.8	5	3.3	0
Mining	178.3	2.7	4.9	18.5	1.11
Oil and Gas	695.6	172.1		5.3	47.55
Manufacturing	923.5	319.2	19.6	13.1	77.39
Power					
Transport & Communication	47.9	106.6			7.89
Hotel and Tourism	114.9	40		15.5	5.25
Real estate Development	623.5	122.2			28
Industrial estate	181.1				
Consturction	17.3				20.5
Other Services	8.6	3.1			10
Total	2814.2	777.4	29.5	55.7	217.69

Source: Myanmar Statistical Year Books
Note: Blank cell means no FDI

Appendix 5. Permitted Foreign Direct Invest (FDI) by Sector Under Military Rule in Second Phase (Absolute Values in US $ Million)

Sector	2005	2006	2007	2008	2009	2010
Agriculture						
Livestock & Fisheries				12		
Mining	6	0.7		5	855.99	2.5
Oil and Gas	142.55	34.98	438.48	170	114	278.6
Manufacturing	3.52	0		18.72	(-)1.392	33.23

Sector						
Power		6030	281.22			
Transport & Communication						
Hotel and Tourism	3.5				15	15.25
Real estate Development	2.71					
Industrial estate						
Consturction						
Other Services						
Total	158.28	6065.68	719.7	205.72	984.76	329.58

Source: Myanmar Statistical Year Books
Note: Blank cell means no FDI

Appendix 6. Permitted Foreign Direct Invest (FDI) by Sector Under New Civilian Government

(Absolute Values in US $ Million)

Sector	2011	2012	2013	2014	2015
Agriculture	138.75		9.65	20.27	39.67
Livestock & Fisheries			5.6	96.02	26.86
Mining	1396.08	19.9	15.33	32.73	6.26
Oil and Gas	10179.3	247.7	309.2		3220.31
Manufacturing	66.32	32.25	400.72	1827.28	1502.01
Power	8218.52	4343.98	364.2	46.51	40.11
Transport & Communication		0.63	0	1190.23	1679.3
Hotel and Tourism			300	435.21	357.95
Real estate Development				440.57	780.75
Industrial estate					
Consturction					
Other Services			14.77	18.23	357.32

Total	19998.965	4644.46	1419.47	4107.06	8010.53

Appendix 7. Permitted Foreign Direct Invest (FDI) by Sector Under New Civilian Government

(Absolute Values in US $ Million)

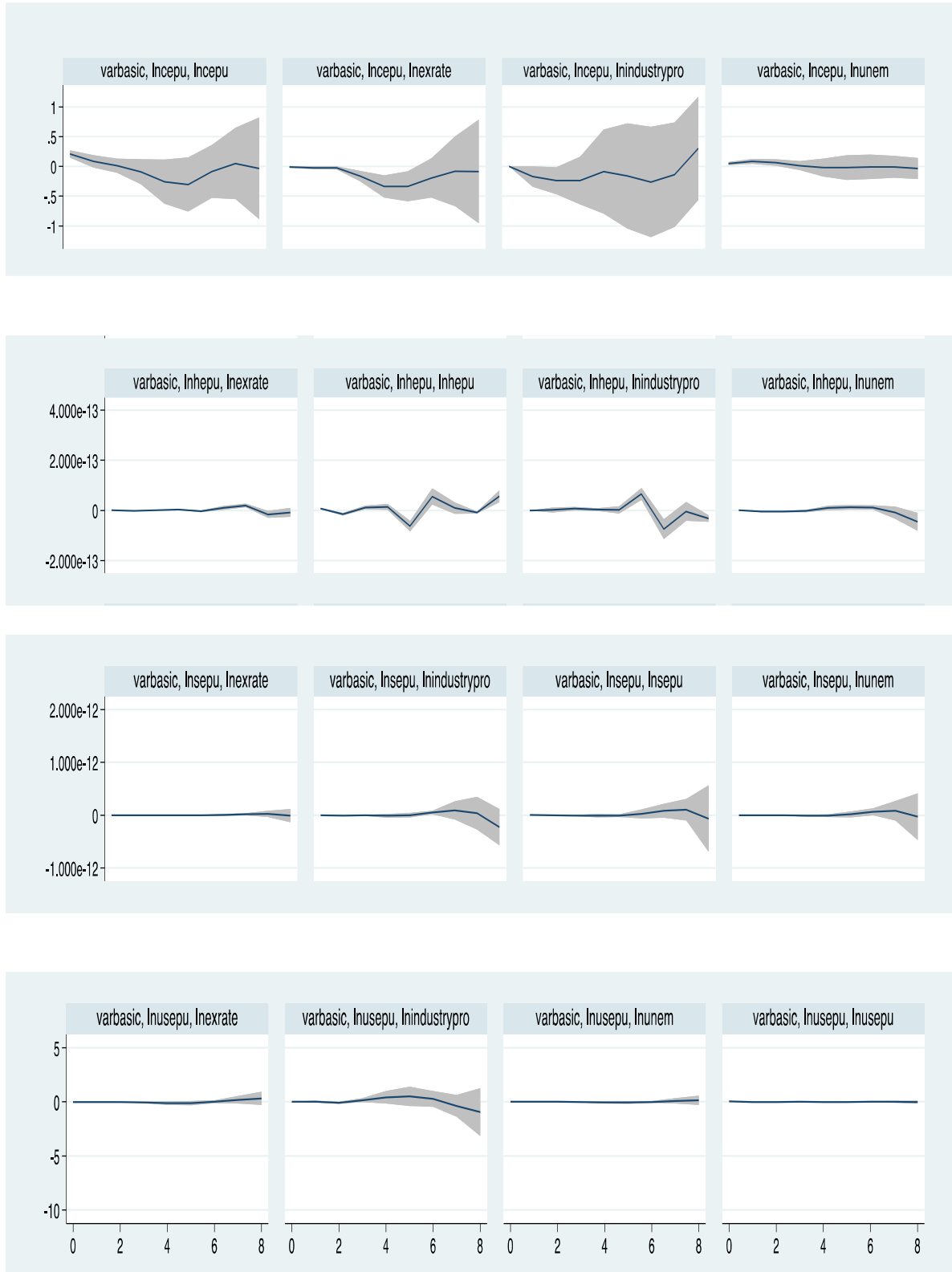| Sector	2016	2017	2018	2019
Agriculture	7.18		145.14	19.12
Livestock & Fisheries	8.25	96.68	60.62	156.9
Mining	28.92		7.31	
Oil and Gas	4817.79			10.2
Manufacturing	1069.85	1179.51	2475.86	1347.83
Power	360.1	909.88	498.45	93.28
Transport & Communication	1931	3081.15	1215.8	1538.4
Hotel and Tourism	288.4	403.65	186.31	82.62
Real estate Development	728.68	747.62	1542.36	2110.93
Industrial estate	10		68.52	48.45
Consturction				
Other Services	235.96	231.32	1282.44	650.74
Total	9486.12	6649.81	7482.8	4158.47

Appendix 8. Structural Change in the Economy Under Military Rule (1988-2011)

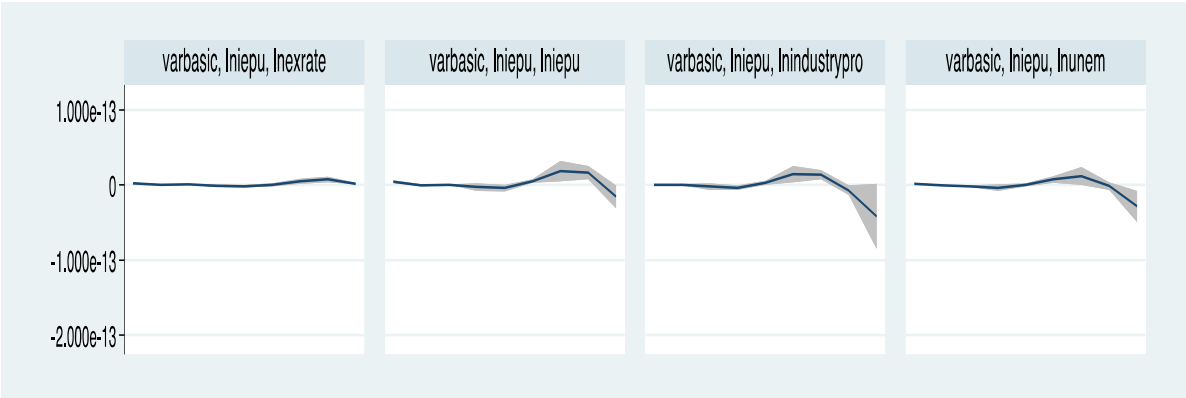| Government Era	Year	Agriculture	Industry	Service
Miliyary Rule	1990	57.3	10.5	32.2
	2000	59.7	9.1	40
	2001	57.24	9.69	33.07
	2002	57.07	10.58	32.35
	2003	54.53	13.01	32.46
	2004	50.62	14.26	35.12
	2005	48.35	16.21	35.44
	2006	46.69	17.51	35.8
	2007	43.48	19.43	37.09
	2008	43.32	20.41	36.27
	2009	40.28	22.67	37.06
	2010	38.11	24.53	37.36
Initial New Civilian Government	2011	36.85	26.47	36.68
	2012	32.5	31.29	36.21
	2013	30.59	32.37	37.04
New Democratic Government	2014	29.53	32.36	38.1
	2015	27.83	34.49	37.68
	2016	26.75	34.54	38.71
	2017	25.5	35.00	39.50
	2018	23.3	36.30	40.40
	2019	21.3	38.00	40.70
Military Coup of 2021	2020	20.93	38.58	40.49
	2021	23.46	35.22	41.33

Sources: Myanmar Statistical Year Books, World Bank Data

Source: Myanmar Statistical Year Books

Appendix 10: The Impulse Response of Major Trading Partaners' EPU to Myanmar Economy

Note: Shaded Area mean 95% Confidence Interval