

THE TRILEMMA CONSTRAINT: WILL
INTERNATIONAL RESERVE OR FINANCIAL
DEVELOPMENT BREAKS THE RULE?

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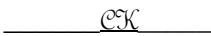

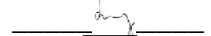
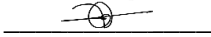
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TABLE OF CONTENTS

		Page
Copyright Page.....		ii
Declaration.....		iii
Acknowledgement.....		iv
Table of Contents.....		v
List of Tables.....		x
List of Figures.....		xi
List of Abbreviations.....		xii
List of Appendices.....		xv
Abstract		xvii
CHAPTER 1	INTRODUCTION.....	1
1.0	Introduction.....	1
1.1	Research Background.....	1
1.1.1	The Trinity Goals.....	1
1.1.2	Stability in Currency Exchange Rate.....	2
1.1.3	Sovereign of Monetary Policy.....	3
1.1.4	Free Capital Movement (Absence of Capital Control)	4
1.1.5	Trilemma Policy: Can we achieve all in the sometime?.....	5

1.1.6	Evolution of Trilemma in Modern Era....	7
1.1.7	Possibility of Impossible Trinity.....	8
1.1.7.1	Mexico peso Crisis in 1994	8
1.1.7.2	Asian Financial Crisis 1997-98 ...	9
1.2	Problem Statement.....	12
1.3	Research Objective.....	16
1.3.1	General Objective.....	16
1.3.1	Specific Objective.....	16
1.4	Research Question.....	17
1.5	Significance of Study.....	17
CHAPTER 2	REVIEW OF LITERATURE	19
2.0	Introduction.....	19
2.1	Review of Relevant Theoretical Model.....	19
2.1.1	Mundell-Fleming Model (1964)	19
2.1.2	IS Curve (Investment – Saving Curve) ...	20
2.1.3	LM Curve (Liquidity Preference – Money Supply Curve)	22
2.1.4	BP Curve (Balance of Payment Curve) ...	24
2.2	Review of Relevant Literature	26
2.2.1	Impossible Trinity Arises in both Developed and Developing Countries	26

	2.2.2	Does International Reserve help the Policy Marker Achieve from Trilemma to Quadrilemma?	28
	2.2.3	Is it the Financial Development More Suitable Than International Reserve to Achieve the “Possible Trinity”	30
	2.3	Conclusion.....	32
CHAPTER 3		METHODOLOGY.....	34
	3.0	Introduction.....	34
	3.1	Theoretical Model.....	34
	3.2	The Model.....	35
	3.3	Preliminary Test	39
	3.3.1	Panel Unit Root – Levin, Lin, and Chu (LLC)	39
	3.3.2	Panel Unit Root – Im, Pesaran, and Shin (IPS)	40
	3.3.3	Panel Unit Root – Fisher Augmented Dickey Fuller (Fisher - ADF)	40
	3.4	Panel Data Model.....	41
	3.4.1	Pooled Ordinary Least Square (POLS)..	41
	3.4.2	Fixed Effect Model (FEM).....	42
	3.4.3	Random Effect Model (REM)	43
	3.5	Model Specification Tests.....	44

3.5.1	Poolability F-Test.....	44
3.5.2	Breusch-Pagan Lagrange Multiplier....	45
3.5.3	Hausman Test	45
3.6	Sources of Data.....	46
3.7	Definition of Variables.....	48
3.7.1	Real GDP per-capita Growth rate (Growth)	48
3.7.2	Exchange Stability Index (ERS).....	48
3.7.3	Monetary Independence Index (MI)	49
3.7.4	Financial Openness Index (FO).....	49
3.7.5	International Reserve per GDP (IR).....	51
3.7.6	Financial Development Index (FD).....	51
CHAPTER 4	DATA ANALYSIS	53
4.0	Introduction.....	53
4.1	Panel Unit Root Test.....	54
4.2	Panel Model Estimation.....	57
4.2.1	Panel Model Estimation – Which Combination of Policies have Greatest Positive Impact on Countries Economic Growth.....	57
4.2.2	Panel Model Estimation – Which Combination of Policies have Greatest Positive Impact on Countries Economic Growth Takes in Consideration of International Reserve.....	66

	4.2.3 Panel Model Estimation – Which Combination of Policies have Greatest Positive Impact on Countries Economic Growth Takes in Consideration of Financial Development.....	73
CHAPTER 5	DISCUSSION, CONCLUSION AND IMPLICATION.....	81
5.0	Introduction.....	81
5.1	Summary and Major Finding.....	81
5.2	Implication of Study.....	85
5.3	Limitations of Study.....	87
5.4	Recommendation for Future Research.....	88
5.5	Conclusion.....	89
	References.....	91

LIST OF TABLES

	Page
Table 3.1: Sample of Countries, High and Upper-middle Income...	37
Table 3.2: Sample of Countries, Lower-middle and Low Income....	38
Table 3.3: Source of Data.....	47
Table 4.1: Result of Panel Unit Root In Level.....	54
Table 4.2: Result of Panel Unit Root at First Difference.....	55
Table 4.3: Results of Panel Model Estimation, All Countries.....	61
Table 4.4: Results of Panel Model Estimation, High Income Countries.....	62
Table 4.5: Results of Panel Model Estimation, Upper-middle Income Countries.....	63
Table 4.6: Results of Panel Model Estimation, Lower-middle Income Countries.....	64
Table 4.7: Results of Panel Model Estimation, Low Income Countries.....	65
Table 4.8: Results of Panel Model Estimation, All Countries.....	68
Table 4.9: Results of Panel Model Estimation, High Income Countries.....	69

Table 4.10: Results of Panel Model Estimation, Upper-middle	
Income Countries.....	70
Table 4.11: Results of Panel Model Estimation, Lower-middle	
Income Countries.....	71
Table 4.12: Results of Panel Model Estimation, Low Income	
Countries.....	72
Table 4.13: Results of Panel Model Estimation, All Countries.....	76
Table 4.14: Results of Panel Model Estimation, High Income	
Countries.....	77
Table 4.15: Results of Panel Model Estimation, Upper-middle	
Income Countries.....	78
Table 4.16: Results of Panel Model Estimation, Lower-middle	
Income Countries.....	79
Table 4.17: Results of Panel Model Estimation, Low Income	
Countries.....	80
Table 5.1: Summary of Results.....	82

LIST OF FIGURES

	Page
Figure 1.1: Exchange Rate Agreement.....	2
Figure 1.2: The Impossible Trinity.....	6
Figure 1.3: Real GDP Growth Rate from 1980 to 2015.....	11
Figure 2.1: Derivation of IS Curve.....	21
Figure 2.2: Derivation of LM Curve.....	23
Figure 2.3: Derivation of BP Curve.....	25
Figure 2.4: Slope of BP Curve.....	25
Figure 5.1: Average Combination of Trilemma Policy with Interaction of Financial Development	83

LIST OF ABBREVIATIONS

ADF	Augmented Dickey Fuller
BP	Balance of Payment
BPLM	Breusch-Pagan Lagrange Multiplier
ECB	European Central Bank
EMU	European Economic and Monetary Union
ERS	Exchange Rate Stability
FD	Financial Development
FDI	Foreign Direct Investment
FO	Financial Openness
FEM	Fixed Effect Model
RGDP	Real Gross Domestic Product
IS	Investment – Saving
IMF	International Monetary Fund
IR	International Reserve
LAC	Latin AmericaCaribbean
LM	Liquidity Preference – Money Supply
MI	Monetary Independence
POLS	Pooled Ordinary Least Square
REM	Random Effect Model
SAR	Special Administrative Region

ABSTRACT

This research paper is conducted to determine the relationship between the economic growth and Trilemma policy. The Trilemma policies are exchange rate stability, monetary independence and financial openness. However, it is impossible to achieve all policies simultaneously which can be also known as “impossible trinity”. Therefore, due to the constraint of the Trilemma policy, there is an extension of study to determine the economic growth and Trilemma policy with the interaction term of international reserve and financial development where the financial development to replace financial openness in order to achieve “possible trinity”.

The variables involved are Trilemma policy index which are exchange rate stability index, monetary independence index, financial openness index, international reserve and financial development. There are total of 149 countries had been chosen according to the income level of the country respectively to conduct the research. The period of data is from 1981 to 2017 and is collected on annual basis. Besides, unbalanced panel data had been chosen in order to conduct in this research and panel unit root tests, panel model estimation and specification tests analysis will be carried out.

In the findings, it is still unable to maximize the economic growth though Trilemma policy with the presence of international reserve. However, the trilemma policy only shows statistically significant to the economic growth with the presence of financial development for high income countries. The findings of this study carry important implications for government policymakers and researcher for a reference or suggestion.

Key words: Trilemma, Impossible Trinity, Economic Growth, Exchange Rate Stability, Monetary Independence, Financial Openness, International Reserve, Financial Development

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

This chapter will be discussed the research background regard to impossible trinity's history as well as how the countries tried to break impossible to possible trinity, problem statement, research questions, research objectives and significant of study in this chapter. The main objective of this research is to study the trilemma or impossible trinity effect on economic growth. Besides that, the research also takes the international reserve and financial development as an interaction term with trilemma combination respectively in order to observe the effect on the economic growth.

1.1 Research Background

In this chapter will discuss about the general idea of the "Impossible Trinity". The main objective of our research is to study the impact of the trilemma to the economic growth. Besides, the research will also study about the impact of trilemma when there is an interaction with international reserves or financial development.

1.1.1 The Trinity Goals

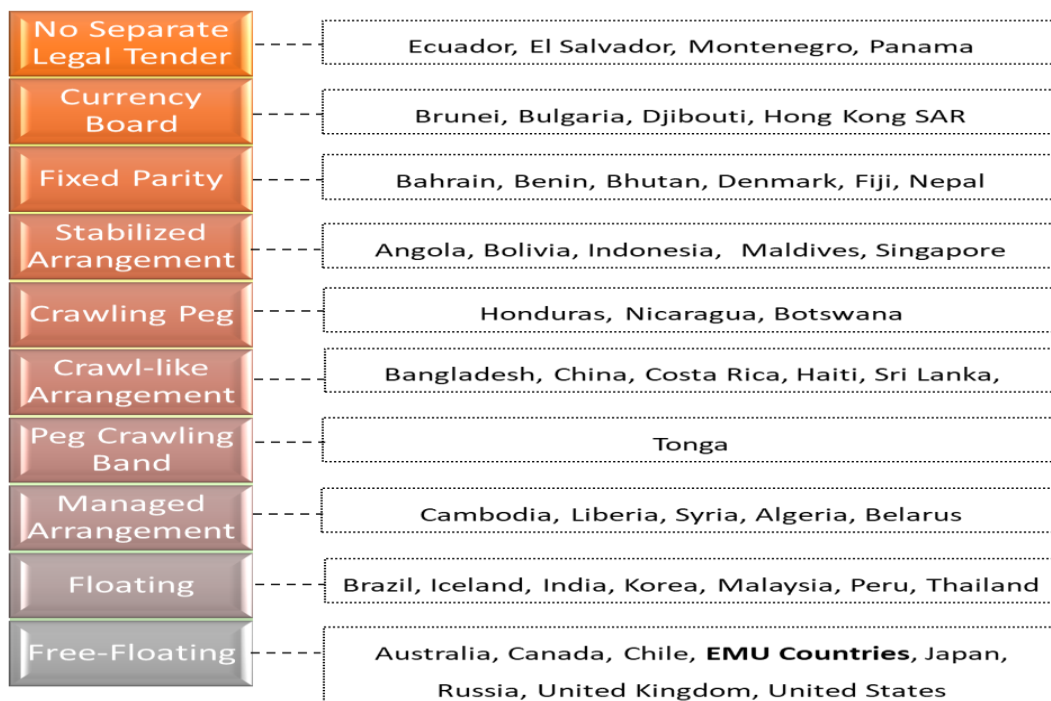
The trinity goals can be defined as the macroeconomics theory which mentions that it is impossible to achieve all three policies simultaneously. Therefore, it also known as "impossible trinity". According to Aizenman (2019) stated that trilemma is important to understand the development of global financial architecture as well as to eliminate financial fragility in the future days. The shortage of policy tools relative to the policy goals show the trade-offs complexity between the policy goals for each country. The basic concept of Trilemma is the government only can choose two out of

three policy goals which are the fixed exchange rate, financial openness, and monetary independence. However, since all these three goals are attractive to boost the economy, policymaker will always try to pursue the greatest value of the indices (Majumder & Nag, 2017).

1.1.2 Stability in Currency Exchange Rate

Fixed exchange rate can be defined as the monetary authorities fixed their home currency with other foreign currency, in a sense that the uncertainty of the currency fluctuation will be eliminated. Besides, fixed exchange rate is to maintain the value of the currency within a small gap. Therefore, those policymakers will likely to implement fixed exchange rate system instead of floating in order to boost their economic condition.

Figure 1.1 Exchange Rate Agreement



Sources: International Monetary Fund (IMF), Annual Report on *Exchange Arrangements and Exchange Restrictions 2018*.

Figure 1.1 is the type of exchange regime and the countries adopted in 2018. There are few reasons why the policymakers will likely to implement fixed exchange rate system rather than floating since fixed exchange rate can become an efficient tool in achieving the cooperative solution. Firstly, fixed exchange rate will get rid of the currency risk, therefore it will stimulate the international trade and investment. Besides, the transaction costs will be eliminated since fixed exchange rate is pegging the home currency with another foreign currency (Frankel, 2003).

The second reason which is it will be maintained a low inflation rate of the country through fixed exchange rate. Fixed exchange rate will help to control the local inflation pressure by pegging to a foreign currency with low inflation, which the inflation pressures normally come from the excessive government budget deficits or the decision making of the wage and price set by the private sector (Obstfeld & Rogoff, 1995).

Thirdly, fixed exchange rate will refrain the competitive devaluation or competitive appreciation. Competitive devaluation can be defined as there is an intervention intentionally by the country to depreciate the value of their currency in order to create a competitive boost to demand and jobs in their export industries.

1.1.3 Sovereign of Monetary Policy

Monetary policy independence is about directing the changes of short-term interest rates, which in turn affects the domestic savings and investment balance as well as monetary policy. However, monetary policy is essentially an action plan taken by policy maker generally the central bank to control and regulate the money supply with the public and the intention to achieve macroeconomic goals (Abata, Kehinde & Bolarinwa, 2012). Thus, policy maker pays more attention on the monetary policy in order to enhance the economic growth.

First of all, central bank can freely control the money supply in a floating exchange rate regime. Central bank can lower the domestic interest rates to increase the money supply in order to stimulate investment and economic growth. Lower interest rate make price to fall which can help to keep spending at a consistent level.

On the other hand, central bank can implement contractionary policies to reduce the money supply to control the inflation levels and expansionary policy is to stimulate economic activities in response to unemployment during the recession (Gul, Mughal & Rahim, 2012). The expansionary monetary policy is used to increase the money supply by decreasing interest rates to stimulate consumer spending and business activities.

1.1.4 Free Capital Movement (Absence of Capital Control)

Financial openness can be known as a condition where current administrative and market-based barriers on capital movement across the frontier have been eliminated. While many countries are benefited from the financial openness, those countries have been improved the economic growth. Therefore, it is important that policymaker have to implement the financial openness to boost the economy growth.

Firstly, financial openness may help in improving the output stability by providing greater access to capital and hence assisting capital-poor countries to diversify their production base. In addition, financial openness will help promote institution reforms that can make the financial system more stable as a result improving output stability (Kim, Lin & Suen, 2012).

Moreover, financial openness gives access to affect domestic investment and growth. The significant type of capital inflow is foreign direct investment (FDI). FDI will promote the transfer or diffusion of management and technology to form a new varieties capital inputs and enhance the skill composition of the labour force by investing in formal education and on-the-job training (Garita, 2009).

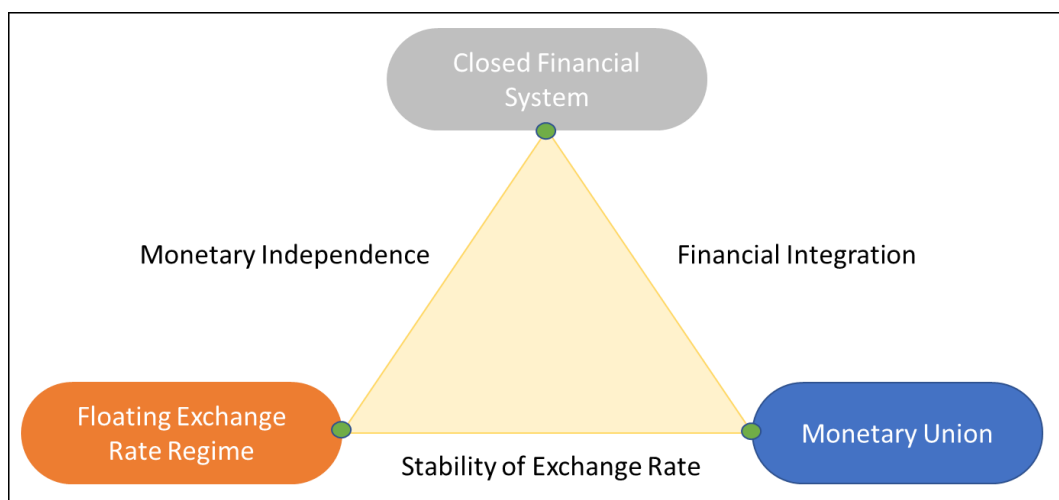
Last but not least, financial openness is likely to enhance banking and financial system efficiency by reducing costs and excessive profits associated with monopoly and cartelized and hence reducing the investment cost and enhancing resource allocation (Agénor, 2003). Besides, the penetration of foreign bank will stimulate the development of domestic banking supervision and legal framework when the local foreign banks merge with their parent banks.

1.1.5 Trilemma Policy: Can we achieve all in the same time?

In practise, policymakers enable to achieve these all of three goals at the same time according to the Mundell-Fleming framework. Trilemma is also synonymous with the “impossible trinity” is a contribution of the Mundell-Fleming framework (Aizenman, Chinn & Ito, 2011). The concept of trilemma is developed by the economists who are Robert Mundell and Marcus Fleming in 1960s. The concept of trilemma explains that a country may choose any two, but not all three policy goals to achieve at the same time which are monetary independence, exchange rate stability and financial integration (Aizenman, 2013).

The reason is the three goals are mutual exclusively. When a country has a reliable fixed exchange rate and an open financial market, its interest rate must follow the interest rate of the base country, which means sacrificing monetary autonomy. On the contrary, state for an example, an increase in the base country interest rate that is not matched by the home country would cause investors to transfer fund to assets denominated in the higher interest rate currency and hence generate a depreciation of the exchange rate. Therefore, a country has to maintain the monetary autonomy required that it must either allow the exchange rate to change or close down the capital flow from the foreign countries (Klein, & Shambaugh, 2015)

Figure 1.2: The Impossible Trinity



Based on the Figure 1.2 above, each of the three sides of triangle represents the different desirable combination of policy goals. However, the three sides of triangle may not be implemented at the same time, must give up either one of these three policy goals. From the top vertex of Figure 1.2, it marked to “closed financial system” which is related to monetary independence and fixed exchange rate, but giving up financial integration. Besides, the right vertex it marked to “monetary union” is related to fixed exchange rate regime (peg with other countries) and financial integration, but no monetary policy autonomy. The left vertex, marked to “floating exchange rate regime” is related to monetary independence and financial integration (free flow of capital), but exchange rate is not stable. Based on same figure, a more tempered view is that the trilemma highlights real-world trade-offs; if financial markets are open, more autonomy requires greater exchange rate flexibility, or, conversely, if exchange rate stability is to be maintained, more closed capital markets are needed. Besides, the trilemma also became a significant problem that causes some countries suffering from the financial crisis.

1.1.6 Evolution of Trilemma in Modern Era

As what mentioned that three trilemma policies: monetary independence, stability of exchange rate and financial integration a countries can only achieve two of it, unable to get three goal simultaneously (Aizenman, Chinn, & Ito, 2010). After the 1997 Asian Financial Crisis, many Asia and Southeast Asia nations, the countries such as Thailand, Philippines, and others gave up the peg exchange rate during that period. China-Hong Kong, special administrative region also one of the areas that have huge significant impact on the 1997 Financial Crisis, but Hong Kong able to sustain HK\$ peg with US dollar (US\$). A composite exchange rate implements in Mainland China from year 2005 onward, a demand and supply refer to a basket of currencies, which included the major currencies of US, and Singapore dollars, Thai Baht (Ilzetzki, Reinhart, & Rogoff, 2019). According to Finger and Lopez (2019), many countries are no or least limit on capital inflow and outflow, yet China and Vietnam imposed capital control on foreign investors. In China, residents generally are not allowed to invest abroad (Cowen, Salgado, Shah, Teo, & Zanello, 2006).

In European continent, European Economic and Monetary Union (EMU) began to the final stage on 1st January 1999. The 11 founding member countries such as, Germany, Finland, France, Italy and the others 7 countries adopting with the common currency, Euro € and locked their mutual exchange rate (European Central Bank, n.d.). Since, the Eurozone countries entered into monetary union, they surrendered their country monetary liberation and the ability of print and create currency, only European Central Bank (ECB) allowed to do so. Countries like Denmark, Bulgaria, and other non-Eurozone countries, however their nation's currency pegged with Euro €, and emphasis on financial integration policy instead of monetary independence.

Moreover, Latin America Caribbean (LAC) countries have similar pattern on exchange rate regime, Brazil, Chile and Peru are adopted the floating exchange rate, among the countries their monetary policies are

independence as well as focus on inflation-target framework. Ecuador, El Salvador, and Panama these countries are pegged their exchange rate with US\$, forgone the monetary policies autonomy. Financial openness of Latin America emerging countries was faced current account widened across the region, so like Brazil loosen the capital restriction by eliminate the financial operation tax, the contradict result happen in Argentina and Venezuela, they strictly control on private sector capital outflow (AmerQuarterly, 2013).

1.1.7 Possibility of Impossible Trinity?

According to the Trilemma policy, the government can only achieve two out of three policies in the same time. However, the combination of the three policies which is exchange rate stability, absence of capital control and monetary independence, is known to cause financial crisis. The Mexico peso Crisis (1994–1995) and the Asian Financial Crisis (1997–1998) are the most common related examples.

1.1.7.1 Mexico peso Crisis in 1994

In the early 1990s, Mexico's economy looked healthy which the country had reduced its long-term debt, increased loans from multiple institutions, maintained fiscal prudence as well as carried out the market-oriented reforms, all of these actions seemed to indicate macroeconomic stability (Lustig, 1995; 2001). The Mexico peso crisis happened due to the devaluation of the Mexican peso in December 1994. This uncorrected the overvaluation eventually lead to speculative attack on the Mexican peso currency when the international reserves holding in Mexico bank were too low. The event followed the devaluation of peso in 1994, there was a serious reaction of financial markets to a Mexican devaluation which those the investors in the share market or money instruments had

immediate withdraw their capital as soon as possible from the Mexico financial markets. Aftermath of this move, the foreign investors suddenly withdrew more than \$3 billion from Mexico's capital market in a single day (Springer & Molina, 1995; Perezieto, 2010).

International reserve is one of the major causes of financial crisis where the Mexico's international reserve had sharply declined from \$ 17 billion to less than \$6 billion in the end of December. As a result, it obviously showed that Mexican government was no longer in a position to resist another speculative attack on peso within the low level of international reserve. At that time, Mexico government suddenly implement a floating exchange rate system. However, this did not provide a reliable plan for financial market to tighten the monetary policy and the demand in Mexico continuously reduced. This omission will only further weaken investor confidence. From the outbreak of the crisis in late 1994 to late January 1995, financial markets insisted that Mexico had not sufficient of international reserve to pay weekly amortization payment on Tesobonos (Government bonds pegged to the US dollar), which amounted approximately US\$10 billion for the first quarter of 1995.

1.1.7.2 Asian Financial Crisis 1997 - 98

Based on the history experienced, the financial crisis that happened during 1997 had a strong relationship with the "impossible trinity" policy and the international reserves which is the Asian Financial Crisis. This is the financial crisis that had affected almost all the nations of East Asia and Southeast Asia which had caused a serious economic downturn. Besides, the major causes of this financial crisis were the exchange rate stability, or also known as currency devaluation of the country which is link to one of the policy objectives of Trilemma.

However, the country that had affect the most by this Asian Financial Crisis was Thailand. This crisis was started on 2nd of July 1997, with the serious currency devaluation of around 16 percent in one day for the Thai baht after the government of Thailand was announced that they forced to change their exchange rate from pegged exchange rate to float exchange rate due to the Thai Central Bank do not have enough US dollar to support their home currency – Thai baht anymore (Haque & Kim, 2002).

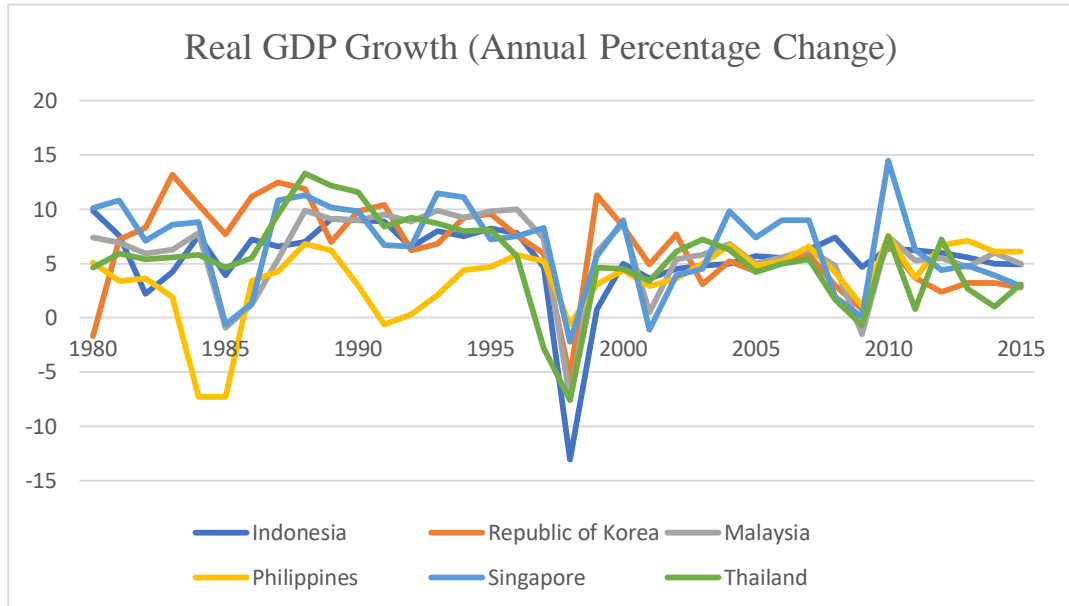
In 1996, Thailand's current account had shown deficit, and many speculators began to observe that baht is overvalued as compared to dollar. Therefore, the speculators started to take advantages and attack the Thai baht which is the exchange rate. In 1997, the speculators started to sell the Thai baht in a large volume and forced the Thai baht depreciate rapidly. Therefore, the government forced to defend their currency peg with baht, however, they had failed to do so.

Before the financial crisis arrived, the Thai Government had implemented the Trilemma all together by fixing their exchange rate through pegged with US dollar, tightening the monetary policy, and encourage the hot money to invest in real estate in Thailand simultaneously. According to Aizenman & Ito (2012) stated that under the rules of Trilemma, a country is unable to achieve all of the following three policy goals – monetary independence, exchange rate stability and financial integration at the same time. The country can only choose any two of the policies simultaneously and one policy has to give in order to grow their economic. However, the Thai government do not follow the rules of Trilemma which they had showed their greedy behaviour to achieve all of the three policy goals altogether at the same time.

However, from the Figure 1.3, the data showed that there is a significant drop of the country's real GDP growth rate during 1997. Therefore, from the data above, it will be an assumption that there is

a significant effect on each country's real GDP growth during the 1997 financial crisis.

Figure 1.3: Real GDP Growth Rate from 1980 to 2015



Source: World Economic Outlook 2019

1.2 Problem Statement

Trilemma policy is one of the important tools to boost and improve country economic. Theoretically, greater of exchange rate stability, financial market openness, and monetary independence able to maintain and improve the country economic. For example, the country economic will be more stable through fixed exchange rate policy. Besides, monetary independence defined as the central bank implement the monetary policy without the intervention of the uncertainty by the other countries' such as macroeconomic shocks and policies that will affect economic growth become more volatile (Ito & Kawai, 2014).

The development of “Mundell Fleming trinity”, also known as “impossible trinity explained that there is an impossible for a country to adopt the financial openness with the currency stability regime and monetary independence simultaneously. In 1990s and 2000s, the impossible trinity obviously showed the real experiences of emerging market where they suffered from serious financial crises. The main reason is that they want to challenge the impossible trinity by achieving the fixed exchange rate, financial openness, and monetary independence simultaneously (Mansour, 2014).

Since a country can only implement two instead of three policy goals simultaneously which are fixed exchange rate, financial openness, and monetary independence and Trilemma had forced the policymakers must give up one of the policy goals. However, according to Aizenman (2010), there will always be an issue occurs when a country decided to choose any two of the policy goals since one of the policy goals had been give up.

Firstly, when a country decides to choose fixed exchange rate and financial openness, this policy configuration indicates that the country must give up the control of monetary independence policy. Under fixed exchange rate system, in order to stabilize their home currency, there must be an intervention by the central bank in the currency market in order to meet the foreign currency demand at the official exchange rate by the public. Therefore, the central bank will lost their control of the money supply and will be passively regulate by the money demand. Besides, a financial openness will not affect the monetary base and local interest

rate. Therefore, this combination of policy show that the determination local interest rate will be ignored since the exchange rate is pegged (Aizenman, 2010).

Secondly, when a country decides to choose monetary independence and financial openness, this policy configuration indicates that the central bank had gave up on fixing their home currency with the other foreign currencies. In the other words, the central bank will let their home currency's exchange rate float with other foreign currencies. Under the floating exchange rate, the interest rate will be reduced through the increased in local money supply which will cause the capital outflow. Therefore, excess demand for foreign currency will cause the devaluation of home currency. In short, a high level of money supply will lower down the interest rate and will stimulate the domestic investment, home currency depreciated which will cause the net exports increased (Aizenman, 2010).

Thirdly, when a country is implementing fixed exchange rate and monetary independence, this policy configuration indicates that the central bank had gave up the financial openness policy. The arbitrage between local and foreign bond can be removed through giving up financial openness, at the same time there will be no relationship of the local interest rate from foreign interest rate (Aizenman, 2010).

Therefore, a natural question had raised up: Which combination is preferable for the policymakers that is more suitable to take into consideration to maximize the country's economic growth and minimize the growth volatility under the constraint of Trilemma?

Due to the financial globalization, there was an upward trend of international reserve began around 1990. It is very important to accumulate the international reserve considering that it has potential impacts on the global interest rate, economic growth, financial stability and as a security of foreign exchange crisis. Besides that, it is a tendency for the policy makers to maintain the competitiveness of the economies. The accumulation of foreign reserve in recent years is because the accumulation competitive which is need for self-insurance against the potential internal and external volatility and instability. The international reserve can be known as an output stabilizer which mitigate the possibility of falls in output caused by a sudden capital outflow or the depth of the output burst when it materializes sudden stop of capital inflow (Aizenman, 2008). According to Ito & Kawai (2014)

stated that the countries with the larger amount of international reserve which allow policy makers to more easily open their financial markets, as reserves can be used to overcome external shocks or speculative attacks that may be caused by financial liberalization. Monetary authorities with higher reserve levels can also engage in sterilization interventions more actively, thereby maintaining greater monetary policy independence.

The holding huge amount of international reserve is potentially useful, but are not a panacea all of the time. According to Aizenman (2013) stated that emerging countries' experiences exhibits that although the trilemma is useful, but it ignores the possibility that the countries with limited but growing financial integration, countries accumulate foreign reserves may relax in the short-run some of trilemma constraints. In 2008-2009 financial crisis shows holding foreign reserves still served as an effective self-insurance way against the crisis. However, this is a costly option, which the international reserve may be insufficient unless it is coupled with the effective policies in managing and reducing total external debt.

In 1990s and 2000s, the impossible trinity obviously showed the real experiences of emerging market where they suffered from serious financial crises due to the policy makers wanted to challenge the impossible trinity by adopting the degree of flexibility simultaneously (Mansour, 2014). Hence, we extend our analysis to examine the problem related to the financial crisis: Can the international reserve use as the tool for crumbling the "impossible trinity" to become "possible trinity"? Come with the "possible trinity" term, do the countries must have an unlimited international reserve to achieve these three policies simultaneously?

Policy makers believe that the financial development will improve the production efficiency which promotes the economic growth. According to Hicks (1969), financial development has played a crucial role in industrialising England which facilitate the capital mobilisation. The global financial crisis has clearly highlighted that the financial regulator authorities had failed to supervise and control the risks associated with financial innovation result in unsound for the financial system and the real economy (Estrada, Park, & Ramayandi, 2010). If the financial development is immature which able to protect the developing Asia from global financial crisis, then Asian financial crisis in 1997-1998 highlighted the huge cost of financial

development. The well-developed financial development can provide larger, wider and more efficient financial market as well as allow the financial intermediaries to take advantages from economies of scales. Besides that, it can also boost up the pool of savings in order to provide resilience against shocks, diversify the investor base and allow to share the uncertainty across the countries.

Hence, here we extend our analysis to investigate the question: Can financial development can be served as the tool to maximize the economic growth? If the policy makers put more effort on their own countries' financial development, so that they can just only focus on the two components of trilemma which are exchange rate stability and monetary independence. The economic growth can be boost up when there is a higher level of financial openness with a greater financial development in one country. The greater financial openness which able to stimulate the economic growth by enhancing the productivity growth through allocating resource more efficient, by releasing financial constraints via greater access to external capital. Furthermore, the holding of international reserve by emerging countries increased dramatically in the aftermath of the East Asian crisis. In contrast, the holding of international reserve ratio by industrial countries quite low due to the ease for industrial countries to undergo bilateral swap lines in case of urgent needs for others countries' currencies as well as their capability to borrow externally in their currencies (Aizenman,2013). This is the reason why the international reserve holding by industrial country will be quite low compared to developing countries due to the industrial countries have a well-developed financial system, hence, they have greater financial openness which allow them to borrow externally easily. In short, policy makers could put more effort to establish well their own financial development rather than accumulate the international reserve due to international reserve might be costlier for holding and not suitable for long-run.

1.3 Research Objective

1.3.1 General Objective

The general objective of this research is to investigate the trilemma effect on economic growth. In particular, the research will look at the inter-relationship between each combination of three policies. Besides, the research will also look at the effect of trilemma combination when there is an interaction between international reserves and financial development. In this study, the research will be focusing on (numbers) of countries according to their income level.

1.3.2 Specific Objective

- i. To investigate which combination of Trilemma has the highest positive effect on economic growth.
- ii. To examine which combination of Trilemma has the highest positive effect on economic growth with the interaction of international reserves.
- iii. To study which combination of Trilemma has the highest positive effect on economic growth with the interaction of financial development.

1.4 Research Question

- i. Which combination of the Trilemma will be maximized the country's economic growth.
- ii. With the presence of limited international reserves, which combination of the Trilemma will be maximized the economic growth of the country.
- iii. With the presence of financial development, which combination of the Trilemma will be optimized the economic growth of the country.

1.5 Significance of Study

The aim of this study is to study the relationship between the dependent variable (economic growth) and independent variable (fixed exchange rate, monetary independence, financial openness, international reserve and financial development). These independent variables are very significant for the whole study. This is because the greater correlation between variables, the more significant relationship between them. Besides, the combinations of the independent variables are significant in order to maximize the economic growth. Thus, this study also investigates the relationship between any two of the trilemma policies (fixed exchange rate, monetary independence and financial openness) and the economic growth when interact with international reserve and financial development.

This study provides some insights to policymaker and central bank as it gives them a picture of what variables are significantly affecting economic growth. Central bank uses the monetary policy to stimulate economic growth by controlling the money supply and demand. This research can provide a guidance for the central bank to draw up the monetary policy to enhance the economic growth. Besides that, policymakers are able to implement the policy easily in their countries in order to maximize the economic growth. Policymaker can be used a better combination of trilemma policy to reduce the possibility in facing the crises. Based on the investor perspective, they have more confident to make their investment when they can

predict that the economic growth is stable by understanding this research. When the investment of a country increases, the economic growth also will be enhanced as a result the unemployment rate can be reduced.

In addition, this study also provides knowledge to lecturer of university, student and researchers as it can learn to control the economic growth of a country. Besides that, they also have an idea that how the international reserve and financial development give the impact on the country's economic. Furthermore, they also have better understanding on the implementation of combination of trilemma policy to different economic situation.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

In this chapter, we revise on past studies about does the foreign reserve able to help the policy makers achieve from trilemma to “Quadrilemma” and the financial development might more suitable instead of foreign reserves. In the related area of previous studies presenting different opinions by different researchers. Other than that, the relevant theory will be discussed in this study is Mundell-Fleming Model which using the IS-LM-BP model to explain how the policy makers to make the decision about the outcome of policy actions.

2.1 Review of Relevant Theoretical Model

2.1.1 Mundell – Fleming Model (1964)

Mundell – Fleming Model can be stated as IS-LM-BP Model which this model can act as a determination of validity of the financial and monetary policies of one open economy country (Cui, Fang & Wang, 2010). This model still playing an important role in policy decision making specifically in the field of investment decision making. This had become a useful tool for the policymakers to make decision about the outcome of policy actions, interest rates and the adjustment of balance of payment by using this Mundell – Fleming model. Besides, Mundell – Fleming model is an expansion of classic IS-LM analysis to an open economy, with the assumption of financial openness, imperfect substitution among the goods from local and overseas, a fixed aggregate price level and variable real output (Sanya & Olanrewaju, 2015).

Since Mundell – Fleming model is the extension of IS-LM-BP model whereby the traditional IS-LM model only applicable with the economy under autarky (Mikail & Indraswari, 2017). However, Mundell – Fleming model able to deal with the opening economy by added the BP curve that will show the external economic balance by the review of the flow of international capitals (Cui, Fang & Wang, 2010).

2.1.2 IS Curve (Investment – Saving Curve)

IS curve can be defined as the set of interest rates (i) and total output or income in the economy (Y) that support the equilibrium in the goods market by assuming there is a constant in everything including the price level. There will be an equilibrium when the quantity supply of goods and services is equivalent with the quantity demand of goods and services. This also can be represented when the “leakages equal to injections” of spending in the theory of economics. Leakage from spending can be denote by the local saving (S), taxes (T), and imports (IM). On the other hand, the injection from spending can be denote by the investment spending (I), government spending (G), and exports (X) (Melvin & Norrbin, 2017).

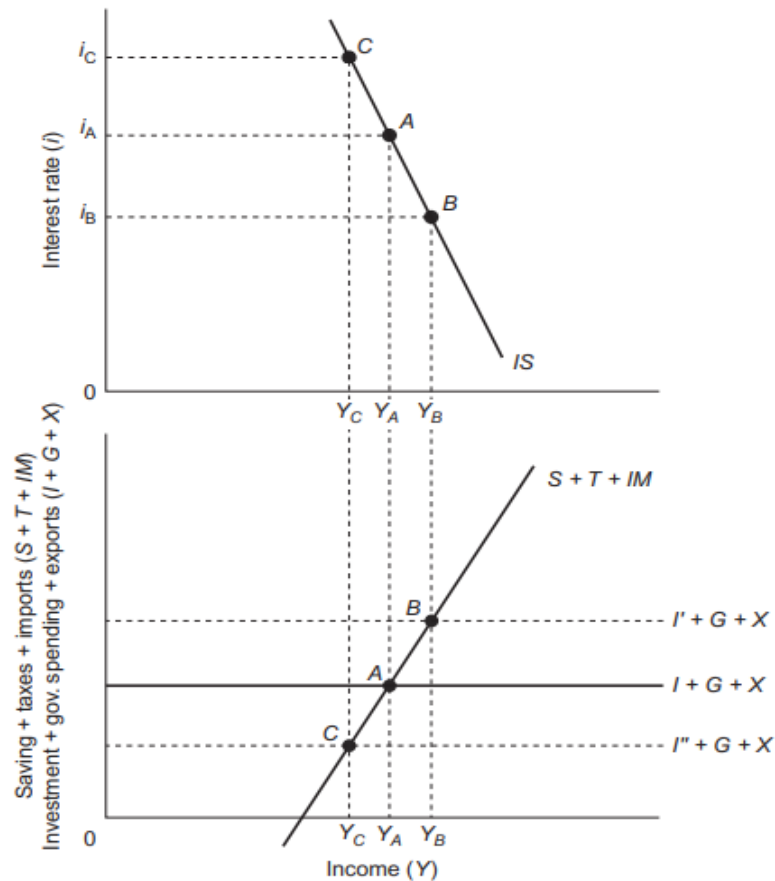
Therefore, there will be an equilibrium in goods market when:

$$S + T + IM = I + G + X \quad (1)$$

The saving and imports are assuming to act as the residents’ income and the taxes are the income by the government. When there is an increase in the local income, the saving from the local residents will be increase. Besides, increase in local income will caused the local residents to purchase more foreign goods which led to import increase. From Figure 5 shows that the line of $S + T + IM$ is in positive slope. This indicates that when the local income increase, it will be led to increase in saving, taxes, and imports. Furthermore, there is an assumption that investment is the function of local interest rate, therefore there will be no effect on the changes in local income. Exports are depending on foreign income but no local income and lastly

government spending is independent of income. Since, there the local income has no effect on the investment, export and government spending, therefore, the $I + G + X$ line is drawn as a flat line.

Figure 2.1: Derivation of IS curve



From Figure 2.1 above, point A shows that an equilibrium points with an equilibrium level of income Y_A . Besides, the changes in the interest rate can fully explain why the IS curve is in downward sloping. For example, the interest rate drop led the investment to rise since the companies able to borrow money to finance their investment project in a lower rate. Therefore, it will shift the $I + G + X$ line to $I' + G + X$ and the equilibrium income rises to Y_B . By looking at the IS curve in the upper panel of the figure, we can see that income will increase when the interest rate decrease and the new goods market equilibrium will be at point B. On the other hand, when interest rate increases, there will be a vice versa effect on the equilibrium income level.

Furthermore, since the IS curve is assuming there will be no effect to the investment, government spending, taxes, and saving when there is a change in local price level. However, if the price level of local products decreased, it will cause the export to increase and import to decrease since the local products are cheaper than foreign products. The income level will increase when the export is greater than import. Since the income rises with a constant interest rate, it will shift the IS curve to the right and IS curve will shift to left when the local price level increase.

2.1.3 LM Curve (Liquidity Preference – Money Supply Curve)

According to Sanya & Olanrewaju (2015) stated that LM curve can be represented by the money market equation which the situation when the money supply is balance with the money demand at the money market equilibrium. Therefore, the LM equation is as below:

$$\text{LM: } M_S = M_D$$

$$\text{Where } M_S = M / P \text{ and } M_D = L(r, y) \quad \therefore M / P = L(r, y)$$

The money supply (M_S), and price (P), are exogenously given variables and the money demand (M_D) is a function of the interest rate (r) and total income (y).

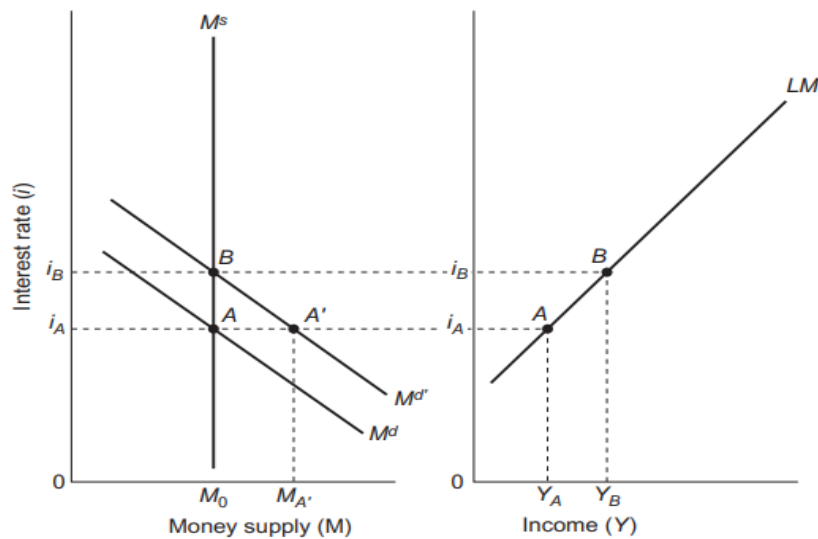
Besides, interest rate is inversely related with the money demand. It is because when the interest rate is low, people will tend to spend their money instead of saving with less interest earn. From the left panel of Figure 6, the initial money demand curve, M_D , is drawn at a given income level. If income rises, the money demand will also rise and she demand curve will shift to right ($M_{D'}$).

In order to understand the upward sloping of LM curve, from the right panel of Figure 2.2, if the income rises from Y_A to Y_B , currency demand will also increase to $M_{D'}$. However, there will be an excess of money demand ($M_{A'}$ –

M_0) when the interest stays at i_A and the money supply remains unchanged which shown in the left panel of Figure 2.2. Therefore, the new money demand will be at $M_{A'}$. In order to balance the quantity of money outstanding, interest rates should increase to a new equilibrium point, B. Point B is consistent with a greater interest rate i_B and a greater income level, Y_B .

Since LM curve is drawn for money supply, the increase in money supply will led to the demand of money to increase in order to achieve the equilibrium point. However, this requires greater income level and lower interest rates which will shift the LM curve to right. Besides, there will be a vice versa effect on LM curve when there is a decrease in money supply.

Figure 2.2: Derivation of LM Curve

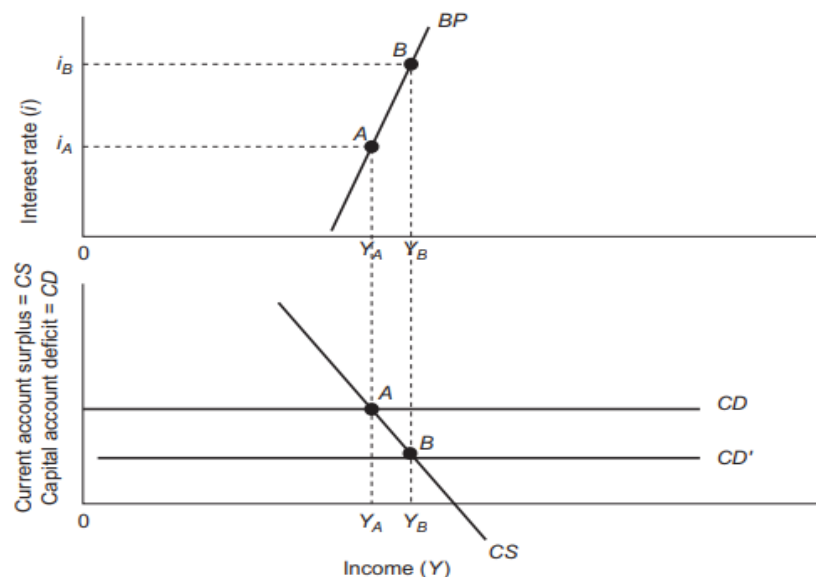


2.1.4 BP Curve (Balance of Payment Curve)

BP curve is the integration of interest rate and income level which create the equilibrium in balance of payment. There will be an equilibrium only when the current account surplus is balance with the capital account deficit in the balance of payment. The lower panel of Figure 7 indicates a current account surplus line (CS) and a capital account deficit line (CD). In practise, current account can be in deficit, which shows that the current account surplus can be negative in value. At the same time, capital account can also in surplus, which shows that the capital account deficit can be positive in value. Besides, the CS line is inversely related with the income due to the import will rise when the income rises which will cause the current account surplus to decrease. However, capital account is in horizontal line is because capital account will only be affected when there is a change in interest rates but not income level (Melvin & Norrbin, 2017).

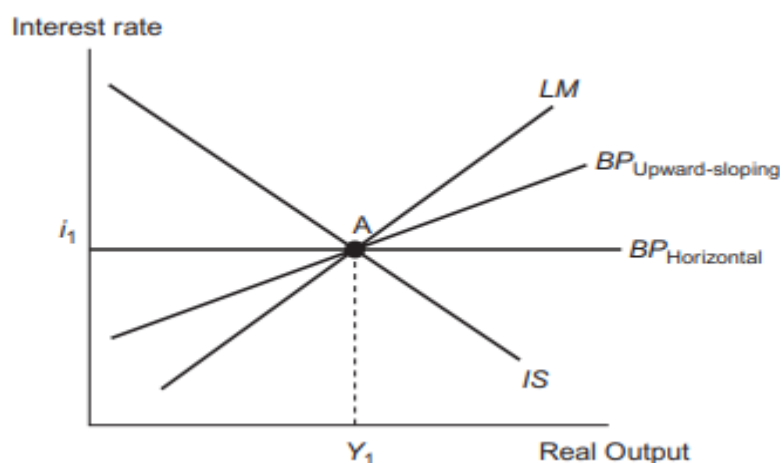
From Figure 2.3, the equilibrium will be at point A with the income level, Y_A and interest rate, i_A . If the interest rates increase, the local financial securities will generate more return and foreign investors will increase. Therefore, there will be a decrease in capital account deficit to CD' and will caused the income to increase in order to maintain the equilibrium.

Figure 2.3: Derivation of BP Curve



From Figure 2.4, BP curve is an upward sloping curve when the foreign capital is not perfectly available because it will attract more foreign buyers to buy the local financial securities whenever there is a greater local interest rate. However, the BP curve can be in horizontal line when their situation of perfectly capital mobility. It is because the foreign investors will only hold the securities with high return when there is any deviation of the local interest rates. Therefore, it is a key to understand whether the BP curve should be in upward sloping or horizontal.

Figure 2.4: Slope of BP Curve



2.2 Review of Relevant Literature

2.2.1 Impossible Trinity Arises in both Developed and Developing Countries

In most countries, the policy makers would like to achieve these three policy goals which are monetary independence, exchange rate stability and financial openness (Aizenman, Chinn & Ito, 2011). Monetary policy is used as a tool to help control the economy. For example, central bank enables to increase money supply by reducing interest rates when the economy is depressed while decrease money supply by raising interest rate when it is

overheats. Besides, households and businesses can engage easily in the world economy and plan for the future when maintaining stability in the currency exchange rate. On the other hand, financial openness encourages foreign investors to bring their capital and expertise into the country as a result stimulates the foreign direct investment and lead to economic growth.

However, some evidences are proved that these three policy goals are unable to implement simultaneously, only can choose two out of the three policy goals as a result the impossible trinity is arisen. According to Aizenman, Chinn and Ito (2011), the researcher showed that developed countries have been experienced the configuration of the trilemma and have conducting the combination of high exchange rate stability and financial openness and low monetary independence. According to Majumder and Nag (2017), they reported that Japan maintained the independence of monetary policy and financial openness by withdraw the exchange rate stability. In addition, Hong Kong lost the independence of monetary policy to achieve the exchange rate stability and capital account openness.

According to Sengupta (2016), a developed country like United States has chosen the monetary independence and financial openness to implement. Any citizen in United State can easily make investment abroad and foreign investors are free to buy stocks and domestic exchanges. Furthermore, the Federal Reserve sets monetary policy to maintain price stability and reduce the unemployment. However, the fluctuations of the US dollar arise in foreign exchange market. On the other hand, according to Mankiw (2010), the Europe's developed countries such as France and Italy have chosen the third way (exchange rate stability and financial openness). They have eliminated all exchange-rate movements and international flow of capital is free to move among foreign countries. But a result in this decision is to give up the monetary autonomy.

Besides that, according to Glick and Hutchison (2009), the developing countries embarked on the path of financial globalization, which has resulted in the rising volume of capital inflow into developing economies and hence conducting the independent monetary policy and maintaining the

stable exchange rate has become a challenge for the policy maker. A rising volume of capital will lead developing countries in facing the risk of sudden stop and capital flight.

According to Aizenman (2013), developing countries like Mexico and Thailand pursued the rapid financial openness and failed to maintain balancing of monetary independence and exchange rate stability. The failure made those countries to suffer from the financial crisis. In contrast, a developing country like China has picked the different combinations which are conducts the independence of monetary policy and maintains the stability of exchange rate (Sheel, 2014). But it has to restrict the international flow of capital, for example, the ability of the citizens in China to invest their capital abroad is restricted. If no such restrictions, capital will flow into or out of the country, forcing the domestic interest rate to match those set by foreign central banks.

Furthermore, Huh, Ji and Park (2016) pointed out that Fiji which is a small-island and open economy country, it conducts effectively the stability of exchange rate and independence of monetary policy but give up financial openness. It is because Fiji is unlikely to be significantly affected by international capital flows due to its capital market and national currencies are still developing, as mean that the financial development and openness are restricted. But, in the future, it is unable to provide the same level of monetary independence when its financial openness increases. However, the purpose of Fiji to execute this policy combination is enhancing the economic growth and reduces volatility of price on domestic good.

According to Goh (2009), Malaysia adopts the exchange rate stability and independence of monetary policy with the control of capital flow in 1998 due to the Asian financial crisis occurred. Malaysia implements the fixed exchange rate and monetary independence in order to protect itself from the large-scale capital flight and substantial currency devaluation. It also helps Malaysia to stimulate the economic growth by lowering the interest rate without concerning about the devaluation of Ringgit and capital flight. In contrast, Malaysia faces the conflict between exchange rate stability and

independence of monetary policy as Malaysia once replaced the control of capital flow to financial openness. Masih (2005) pointed out that since monetary policy aims to maintain the fixed exchange rate by absorbing the net inflow and outflow of capital, fiscal policy is suffered with a huge burden and hard to achieve national goals such as increasing employment and income. Therefore, the persistent fiscal deficit in Malaysia happened since 1998.

2.2.2 Does International Reserve Help the Policy Maker Achieve from Trilemma to Quadrilemma?

The international reserve has played an important role into the trilemma. According to Mansour (2014), conclude that including international reserve will change the pattern of the Mundell Trilemma of emerging countries which lead the impossible trinity to become “possible trinity” or a new configuration known as “Quadrilemma”. This indicates that the policy maker can reach certain level of exchange rate stability and financial openness as well as maintaining high level of monetary independence without any trade-offs by using international reserve with an equal degree. The international reserve seems to be enhanced the stabilizing effect on the trilemma policy choices as well as it may help to increase the awareness on the international reserve in the region especially in the aftermath of the Asian crisis.

According to Aizenman et.al (2010), the countries encounter a high level of output fluctuation when the countries select a policy combination with a larger degree of policy divergence due to the countries holding with the relatively low of foreign reserve. In other side, there is no output fluctuation to the countries with the relatively high foreign reserve holding. Furthermore, a study conducted by Aizenman & Ito (2012), they attempt to measure how the achievement of each three policies in the trilemma and the impact of policy configurations on the macroeconomic performances. The

result showed that the greater monetary independence, the country will experience low output fluctuation while greater exchange rate stability showed higher output fluctuation, but it can be reduced if countries holding the foreign reserve which it must more than a threshold of 20% of GDP.

Econometric evaluations show that some structural changes in how developing countries hold the foreign reserve (Aizenman & Lee, 2007; Cheung & Ito, 2009). There is a significant change occurred in the early 2000s, which is an unprecedented growth of China's international reserve. China's international reserve almost tripled within six years, from about 14% during 1997-2000, to 41% in 2006. This unprecedented increase of holding the international reserve is to deal with the unintended consequences of financial globalization.

However, there is an evidence show that reserve is an important in preventing the financial crises occurred but they are costly and subject to reducing the profits. According to Mansour, 2014, the reserve once beyond the appropriate level, more effort must be focused on the component of the sovereign risk management framework, such as contingent financing mechanisms and national insurance as well as general macroeconomic prudential policies. Moreover, in fact as cited Dorrucchi et.al (2006), a continuously accumulate the foreign reserve may lead to some risk and cost over the time such as inflationary pressures, over investment and asset bubble.

2.2.3 Is it the Financial Development More Suitable Than International Reserve to Achieve the “Possible Trinity”

Since the international reserve are costly option. Hence, we extend our study on the financial development to the trilemma. According to Aizenman (2010), international reserve is not only a component that serve as a fourth policy dimension which is the financial stability also can be served as a fourth objective in policy dimension. Financial development enables capital

to be allocated with more efficiently and it magnifies the shock effect on the domestic economy. Therefore, the degree of financial development has played its significant role that how the policy makers decide to make their trade-offs. A well-established financial development or soundness of financial stability refer to the capability of financial markets to clear financial turmoil and the ability of financial intermediaries to provide financial services without any disruption. Tucker (2014) stated that European Central Bank (ECB) have successfully managed a financial crisis in 2007 to 2008 as ECB acting as a general and individual lender of last resort to ensure the liquidity of the interbank markets.

Furthermore, Aizenman, Pinto, & Radziwill (2007), domestic financial development seen as an essential element to higher growth rather than foreign capital which controlling the quality of domestic institutions and Eichengreen (2003) has also underlined that the significance of local financial development where there are some different patterns in financial development treat it as a tool to assess the prospects for financial integration. Financial deepening or stability makes East Asian countries to mitigate the impacts of recent global financial crisis which it potentially whittles down the significance of the foreign capital in local financial institution, improves economies of scales and increases the marketability of financial markets (Kaur & Singh, 2014). Kaur & Singh (2014) also stated that new regulatory framework can be imposed in East Asia through unilateral action to manage financial deepening and financial integration, this will allow to prevent the value of policy coordination failure. These seem like to be more likely than races to the top because there may be enhance short-run political incentives in order to draw attraction from foreign investment and take advantage from boom economy instead of building institutions that sustain long-term growth.

Besides that, according to Aizenman et al (2010), they used the interaction term between financial development and exchange rate stability. The countries with poor and unstable financial markets for emerging markets, higher exchange rate stability might not result in higher output fluctuation. However, for moderate level of financial development experienced higher

output fluctuation due to these countries are more prefer a steady exchange rate. For emerging markets with moderate or higher degree of financial openness tend to face smaller output fluctuations when they pursue greater exchange rate stability. These results obviously exhibit that if they want to mitigate the output volatility, the emerging countries require to put more effort for establishing a well financial market via financial liberalization. Other than that, the quality and quantity of financial development is positively correlated with the level of financial openness where the policy makers focus on the quality in aspect of financial development will result in the greater magnitude of the correlation (Ito & Kawai, 2018).

According to Obstfeld, Shambaugh & Taylor (2010), financial development also known as financial depth is found to have correlated each other which the more financial depth, the increase of foreign reserve significantly. Rodrik (2006) believes that the emerging countries started financial liberalization in the early 1990s, the holding of foreign reserve has been increased dramatically upon on the size of the local financial institution instead of by real magnitudes such as trade flows. Besides that, the scholars believe that the financial depth (M2/GDP) of emerging countries are increased dramatically due to those countries just desire becoming progressively more fully integrated into world markets. They also further stated that M2 is a major key component for the current uptrend of reserve. Last but not least, the countries with greater financial openness, indicate that the deeper financial depth, and more exchange rate stability which tend to be more foreign reserve. For emerging countries, the effect of fixed exchange rate is weaker, but financial depth (potentially measured by M2/GDP) is very critical and it strengthen over the time. The increasing significant of financial factors will lead to increase greater share of foreign reserve (Aizenman, 2013). This is major reason that the developed countries holding quite low of foreign reserve as compared to the developing countries. The study which is conducted by Aizenman (2013) shows that the foreign reserve/GDP ratio of industrial countries overall is about 4%. However, in the other side of developing countries, the foreign reserve having an upward

trend from about 5% to about 27% due to the industrial countries have a well-developed in financial system.

2.3 Conclusion

In conclusion, this chapter reveals the past literatures and theoretical models that has been carry out by previous researchers in order to study the determinants of economic growth. In this research, it is aimed to find out which combination of trilemma when interact with international reserve and financial development has the significant effect on economic growth. In previous studies, the researchers conclude that each country only can implement two out of the three policies and lead to financial crisis. On the other hand, accumulation of international reserve is not suitable to help policy maker to achieve from trilemma to quadrilemma because the international reserves are costly as a result economy growth is affected. When the financial depth gets deeper, the increase in financial factors helps in accounting for greater share of foreign reserve, hence, financial development is the most suitable to achieve possible trinity. Therefore, financial development is playing a significant role when interact with trilemma policy especially to the developed countries in order to enhance economic growth. Lastly, the methodologies used in this research will be discussed in the following chapter.

CHAPTER 3: METHODOLOGY

3.0 Introduction

This research essentially aimed to dictate the relationship between the economic growth and its manipulated variables which are exchange rate stability, financial openness, monetary independence, international reserve as well as financial development. Hence, it is utmost to possess a great framework of the methodology which consist of all independent variables so as to produce a precise result and deliver an amazing contribution to the relevant study.

3.1 Theoretical Model

The theoretical model allowed to estimate the ideal combination of three policies under the trilemma constraint with two assumption. First, government likely to focus only on the positive aspects of the open macroeconomic policies and pursue in higher levels of attainment in all three policies. Second, government are constrained by the linear correlation of three policies, the initiative for this theoretical model from Ito and Kawai (2014).

$$\min_{ERS, FO, MI} \zeta_1(1 - ERS)^2 + \zeta_2(1 - MI)^2 + \zeta_3(1 - FO)^2 \quad (1)$$

subject to

$$0 \leq ERS, MI, FO \leq 1 \quad \text{and} \quad ERS + MI + FO = 2$$

where ERS, MI, and FO are denoting the trilemma variables i.e.: exchange rate stability, monetary independence and financial openness. The parameters $\zeta_j = (1,2,3 \text{ and } \zeta_j \geq 0)$ refer to the weightage of the government places on each of three macroeconomic goals. *ERS, MI, and FO* assumed to be range between 0 and 1, it represents if a country held 0 FO index means, the country is absence of capital

mobility. Essentially, sum of three policy indexes must be 2, due to three policies goals can only pick two (Aizenman, Chin, & Ito; 2008; 2010; Ito, & Kawai, 2014).

Government should implement the ideal policies combination in order to achieve the problems country were met, thereafter sustain it to achieve the long run economic growth. Different weightage on holding each combination of policy goals would reflect the different economic performance and structure changes on a nation, it depends on preferences of government held. Therefore, optimization problems would happen since the government could not adopted optimal combination of three policies correctly (Ito, & Kawai, 2014).

3.2 The Model

The main purpose of this research is to investigate the role of trilemma in boosting the long run economic performance by using panel data, given that 149 countries from year 1981 to 2017.

$$RGDP = f(ERS, MI, FO) \quad (2)$$

The log-linear model as followed:

$$\log d(RGDP_{it}) = \alpha_0 + \alpha_1 ERS_{it} + \alpha_2 FO_{it} + \alpha_3 MI_{it} + \alpha_4 [ERS \cdot FO]_{it} + \alpha_5 [ERS \cdot MI]_{it} + \alpha_6 [MI \cdot FO]_{it} + \alpha_7 FD_{it} + \alpha_8 IR_{it} + \varepsilon_{it} \quad (3)$$

and

$$\log d(RGDP_{it}) = \beta_0 + \beta_1 ERS_{it} + \beta_2 FO_{it} + \beta_3 MI_{it} + \beta_4 [ERS \cdot MI \cdot IR]_{it} + \beta_5 [ERS \cdot FO \cdot IR]_{it} + \beta_6 [MI \cdot FO \cdot IR]_{it} + \beta_7 FD_{it} + \beta_8 IR_{it} + \varepsilon_{it} \quad (4)$$

and

$$\log d(RGDP_{it}) = \gamma_0 + \gamma_1 ERS_{it} + \gamma_2 FO_{it} + \gamma_3 MI_{it} + \gamma_4 [ERS \cdot MI \cdot FD]_{it} + \gamma_5 [ERS \cdot FO \cdot FD]_{it} + \gamma_6 [MI \cdot FO \cdot FD]_{it} + \gamma_7 FD_{it} + \gamma_8 IR_{it} + \varepsilon_{it} \quad (5)$$

Where $\log d(RGDPG_{it})$ = Differences between t_N and t_{N-1} in logarithm transformation of the RGDP per-capita for (I=1,..., 149) denoting countries and (t=1,..., 37) denoting time annually.

$[ERS \cdot MI]_{it}$ $[ERS \cdot FO]_{it}$ and $[MI \cdot FO]_{it}$ = Vector of two out of any three macroeconomic indexes.

IR_{it} = Country's level of foreign exchange reserve as per GDP %

FD_{it} = Financial development index

ε_{it} = An error term, the excluded factors affecting RGDP per-capita.

$ERS_{it} \cdot MI_{it} \cdot IR_{it}$ in e.(4) and $ERS_{it} \cdot MI_{it} \cdot FD_{it}$ in e.(5) = An interaction term of degree in any two out of three trilemma indexes interaction with level of international reserve and interact with financial development,

$\alpha_i, \beta_i, \gamma_i \leq 0 ; i > 0$.

In equation (3), the core research which it to determine α_i in relationship between each combination of the three policies. In equation (4), and (5) the IR_{it} and FD_{it} consider to represent whether the two variables complement or substitute for other policy stances, how countries economy performance when trilemma combination interactive with these variables.

Since many countries are behave differently, in term of the country's economic problem, structure of country and income per person, distinguish of each country is necessary in order to obtain authenticity result. All the countries will be allocated based on World Bank database Gross National Income per capita (GNI) into 4 categories, High, Upper-middle, Lower-middle, and Low income countries, the list of countries exhibited in Table 3.1 and Table 3.2.

Table 3.1 Sample of Countries, High and Upper-middle Income

High Income (50)			Upper-middle Income (43)		
Antigua and Barbuda	Aruba	Australia	Albania	Algeria	Armenia
Austria	Bahamas	Bahrain	Azerbaijan	Botswana	Brazil
Barbados	Belgium	Canada	Bulgaria	China	Colombia
Chile	Croatia	Cyprus	Costa Rica	Dominica	Dominican Rep.
Czech, Rep.	Denmark	Estonia	Ecuador	Equatorial Guinea	Fiji
Finland	France	Germany	Gabon	Georgia	Grenada
Greece	Hong Kong, China	Hungary	Guatemala	Guyana	Jamaica
Iceland	Ireland	Israel	Jordan	Kazakhstan	Lebanon
Italy	Japan	Korea, Rep	Libya	Malaysia	Maldives
Kuwait	Latvia	Lithuania	Mauritius	Mexico	Namibia
Malta	Netherlands	New Zealand	Peru	Romania	Russian Federation
Norway	Oman	Panama	Seychelles	Sri Lanka	St. Lucia
Poland	Portugal	Qatar	St. Vincent and the Grenadines	Suriname	Thailand
Saudi Arabia	Singapore	Slovak Rep.	Tonga	Tunisia	Turkey
Slovenia	Spain	St. Kitts and Nevis	Venezuela, RB		
Sweden	Switzerland	Trinidad and Tobago			
United Kingdom	Uruguay				

Table 3.2 Sample of Countries, Lower-middle and Low Income

Lower-middle Income (36)			Low Income (20)
Angola	Bangladesh	Bhutan	Burundi
Bolivia	Cameroon	Cape Verde	Central African Rep.
Comoros	Egypt, Arab Rep.	El Salvador	Chad
Ghana	Honduras	India	Congo, Dem. Rep.
Indonesia	Kenya	Kyrgyz Rep.	Congo, Rep.
Lao PDR	Lesotho	Mauritania	Ethiopia
Micronesia, Fed. Sts.	Moldova	Mongolia	Gambia, The
Morocco	Myanmar	Nicaragua	Guinea
Nigeria	Pakistan	Papua New Guinea	Haiti
Paraguay	Philippines	St. Tome and Principe	Liberia
Samoa	Solomon Islands	Ukraine	Madagascar
Vanuatu	Vietnam	Zambia	Malawi
			Nepal
			Rwanda
			Sierra Leone
			South Africa
			Tajikistan
			Tanzania
			Uganda
			Yemen, Rep.

3.3 Preliminary Test

Since panel time series data applied on this study, as preliminary test, conducting panel unit root test is needed, in order to examining stationary of the panel time series data as panel regression involving non-stationary data might be suffer from spurious regression problem.

3.3.1 Panel Unit Root - Levin, Lin, and Chu (LLC)

Many macro and financial data are nonstationary, if remain using the nonstationary data, spurious and unreliable results appeal and it leads to poor understanding and forecasting (Hsiao, 2014). Levin, Lin, and Chu (2002) believe that there is a common unit root process, the homogenous ρ for all i ($\rho_i = \rho$). Here is basic form of LLC test estimating:

$$\Delta y_{it} = \rho y_{it-1} + \sum_{j=1}^{k_i} \beta_{ij} \Delta y_{i,t-j} + Z_{it} \gamma_i + \varepsilon_{it} \quad (6)$$

Where Δ is the first difference operator; Z_{it} is the deterministic components such as fixed effects or a mixture of fixed effect and heterogenous time trends; P is the lag order. Null and alternative hypothesis for LLC test is according to equation (7) and (8), means all series have unit root as well as all series without spurious problem, respectively.

$$H_0: \rho_i = 0, \quad (7)$$

$$H_1: \rho_i < 0 \quad (8)$$

3.3.2 Panel Unit Root - Im, Pesaran, and Shin (IPS)

Im, Pesaran, and Shin (2003) has discovered another bombastic unit root test for dynamic heterogeneous panels based on the mean of individual unit root statistics. According to Breitung (2015), LLC may suffer from severe loss of power in term of the asymptotic effect on the bias due to the detrending technique and second is the usual location parameter of the restricting distribution under the arrangement of local substitutions, the both terms could be offsetting each other, so the LLC test would not have power to against the sequence of local alternative. So Im, Pesaran, and Shin (IPS) is able to overcome the problem.

The basic form of Im, Pesaran, and Shin (IPS) comes to estimating:

$$\Delta y_{it} = \rho_i y_{it-1} + \sum_{j=1}^{k_i} \beta_{ij} \Delta y_{i,t-j} + Z_{it} \gamma_i + \varepsilon_{it} \quad (9)$$

IPS employ a null hypothesis of a unit root:

$$H_0: \rho_i = 0, \quad (10)$$

$$H_1: \begin{cases} \rho_i = 0, & \text{for } i = 1, 2, 3 \dots N_1 \\ \rho_i < 0, & \text{for } i = N + 1, N + 2 \dots, N \end{cases} \quad (11)$$

H_0 each series of panel contains a unit root for all i ; H_1 at least one of the individual series in the panel is stationary.

3.3.3 Panel Unit Root - Fisher Augmented Dickey Fuller (Fisher-ADF)

Another alternative approach to panel unit root tests with individual unit root methods recommended by Maddala and Wu (1999). Fisher-ADF is a nonparametric panel unit root which has the advantage of accepting for as much heterogeneity across units as possible.

For Fisher-ADF tests, the specify of exogenous variables for the test equations is important. It may choose to include no exogenous regressors, to comprise individual constants (effects), or comprise individual intercept and trend terms. Moreover, Fisher-ADF test statistics stipulate the number of lags used in each cross-section ADF regression respectively. The null and alternative hypothesis are equivalent as IPS.

3.4 Panel Data Models

After conducted panel unit root tests, in order to examining whether model consistent with contemporaneous correlation of the errors and independence variables, there are 3 alternative approaches to estimate equation (3), (4), and (5), which is Pooled Ordinary Least Square (POLS), Fixed Effect (FEM) and Random Effect Model (REM).

3.4.1 Pooled Ordinary Least Square (POLS)

Pooled Ordinary Least Squares Model (POLS) assuming homogeneity of all sections in the panel data does not serve them different in a sense that this model did not differentiate between the cross sections data and ignoring the nature of cross section and time series data. The special characteristic of each sections data within the measurement set and general effect is absence from this model over time where this model treats all sections of data as a single characteristic (Adefemi, 2017). This model is assuming the data is react in the same way over years and it can be used the Ordinary Least Squares (OLS) technique to approximation the panel data model (Zulfikar & STp, 2019).

The form of Pooled Ordinary Least Squared Regression Model is as follow:

$$y_{it} = \alpha + \beta X_{it} + \varepsilon_{it} \quad (12)$$

Description:

For $i = 1, 2, 3, \dots, N$; $t = 1, 2, 3 \dots, T$.

Where N = total of individuals on cross section and T is number of durations on time period.

3.4.2 Fixed Effect Model (FEM)

Fixed Effect Regression Model (FEM) assuming heterogeneity or allows each individuals cross-section to have their individual intercept. However, although this model allows each individual to have their specific intercept, but it is time invariant which means the intercept of each cross-sections does not change over time (Adefemi, 2017). Besides, the FEM can be predicted through dummy variable in order to distinguish the intercept of each sections of data where this method can be known as Fixed Effect Least Squares Dummy Variable (FELSDV). In short, dummy variable method is used in order to distinguish the intercept of each cross-section data (Zulfikar & STp, 2019).

The form of Fixed Effect Regression Model is as follow:

$$y_{it} = \alpha_i + \beta X_{it} + \varepsilon_{it} \quad (13)$$

Description:

For $i = 1, 2, 3, \dots, N$; $t = 1, 2, 3 \dots, T$.

Where N = total of individuals on cross section and T is number of durations on time period.

3.4.3 Random Effect Model (REM)

Random Effect Regression Model (REM) assuming heterogeneity and time invariant however the correlation between specific effect and independent variables is absence (Adefemi, 2017). In this model, the divergence between intercepts is captured by the error term of each cross-section. Besides, the cons of using this model is to vanish the heteroscedasticity problem where the model can be known the Error Component Model or Generalized Least Square method. Furthermore, this model is distinguishing from the general and fixed effect, particularly there is no OLS principle is being applied, but applying the maximum likelihood or general least square in this model (Zulfikar & STp, 2019).

The form of Random Effect Regression Model is as follow:

$$y_{it} = \alpha + \beta X_{it} + \mu_i + \varepsilon_{it} \quad (14)$$

Description:

For $i = 1, 2, 3, \dots, N$; $t = 1, 2, 3, \dots, T$.

Where,

N = total of individuals on cross section and T is number of durations on time period.

ε_{it} = is the residual as a whole where the residual is a combination of cross section and time series.

μ_i = is the individual residual which is the random characteristic of unit observation the i -thand remains at all times.

3.5 Model Specification Tests

Model specification tests are an aid to make decision on choosing most appropriate estimate from 3 different approaches. There are 3 tests were used on identify the suitable model which is Poolability F-test, BP Lagrange Multiplier test, and Hausman test. The characteristics of tests were discussed on below:

3.5.1 Poolability F- Test

Poolability test purpose to investigate the presence of individual effect. Most of the empirical panel rejected the null hypothesis of Poolability F test, due to the each of the individual has the own specification or changes, there is impossible two individual behave in same way.

The null hypothesis for Poolability F-test means POLS is endorsed in this study, alternatively FEM is endorsed in this study (Kunst, 2009). The rejection level is at 1% / 5% / 10%. Intuitively, one may consider the F statistic based on the formation principle:

$$F_1 = \frac{(R_{FEM}^2 - R_{POOLED}^2) / (k_{FEM} - k_{POOLED})}{(1 - R_{FEM}^2) / (n - (k_{FEM} + 1))} \quad (15)$$

H_0 : POLS method is preferable than FEM method.

H_1 : FEM method is preferable than POLS method.

R_{FEM}^2 indicates the R squares under Fixed effect model; R_{POOLED}^2 indicates R squares under Pooled OLS model; $(n - (k_{FEM} + 1))$ indicates the degree of freedom.

3.5.2 Breusch – Pagan Lagrange Multiplier (LM)

Breusch and Pagan (1980) originated two-sided LM test for error components in balanced panels. LM Test appears regularly in Hausman unobserved variable test, Chow test and so on. LM statistic also has been established to diminish to some well-known diagnostic tests for autocorrelation. Panel model, LM Test classify the suitability model to be used on random effect regression or simple ordinary least square regression.

Null hypothesis for LM test POLS suggested in this study means there is no significant difference across cross-sectional units, alternatively REM is suggested in this study. The rejection level is at 1% / 5% / 10%.

H_0 : POLS method is preferable than REM method.

H_1 : REM method is preferable than POLS method.

3.5.3 Hausman Test

Hausman Test derived by Hausman (1978) focus on testing the misspecification of econometric model according to the comparison between two different estimators of the model parameters. If a panel data analysis, Hausman Test helps on rejecting inappropriate model either fixed effect model or random effect model, to ensure the model correct specified.

The null hypothesis for BPLM test REM is recommended in this study, alternatively FEM is recommended in this study. The rejection level is at 1% / 5% / 10%.

H_0 : REM method is preferable than FEM method.

H_1 : FEM method is preferable than REM method.

3.6 Source of Data

Data has been used to conduct in this research only secondary in unbalanced panel data. The data in annually form from year 1981 to 2017 total of 149 countries. In this research, the dependence variable is real gross domestic product per-capita growth rate (Growth) which transformed by gross domestic product (GDP), consumer price index (CPI), and population. Data collected from World Bank in annual percentage. The independence variable which is three trilemma indexes (exchange rate stability index, monetary independences, and financial openness index) obtained from Portland State University, international reserves in US Dollar, and financial development (FD) index are the data found in IMF (Table 3.3).

The reasons that chosen 149 countries due to the missing of data unable to trace back, some of the countries like Afghanistan, United Arab Emirates, the trilemma indexes incomplete, therefore those countries will be left out in this research. Moreover, total of 37 years to be used in this research due to the variable, FD index the latest index proposed by IMF, and the initial year for the index in year 1980 and calculating the annual growth rate for each single country. Hence, total panel observations equal to 4,141.

Table 3.3: Sources of Data

Variable (Proxy)	Description	Sources
Real gross domestic product per capita growth , Growth (Economic Performance)	Measurement of different between current year (t_1) and last year (t_0) in logarithm term of total output for a country divided by the number of people and adjusted inflation.	World Bank
Exchange Rate Stability Index , ERS	The stability of exchange rates value for one country's currency in relation to another country's currency value.	Chinn-Ito-Index http://web.pdx.edu/~ito/trilemma_index
Monetary Independence Index, MI	It is directing the changes of short-term interest rates, which affects the domestic savings and investment balance and monetary developments.	~ito/trilemma_index es.htm
Financial Openness Index, FO	The condition where current administrative and market-based barriers on capital movement across frontier have been removed.	
International Reserve per RGDP, IR (International Reserve)	Foreign assets held by a country's monetary authorities to provide liquidity for a nation.	International Monetary Fund (IMF) https://data.imf.org/?sk=388DFA60-1D26-4ADE-B505-A05A558D9A42&slid=1479331931186
Financial Development Index, FD (Financial Development)	Financial instruments, financial market as well as financial intermediaries are developed in a country	International Monetary Fund (IMF) https://data.imf.org/?sk=F8032E80-B36C-43B1-AC26-493C5B1CD33B

3.7 Definition of Variables

3.7.1 Real GDP per-capita growth rate (Growth)

Real gross domestic product per capita means the sum of monotonically declining economic trend and fluctuations related to population changes in certain age (Kitov, 2009). Logarithm real GDP per-capita growth rate measure in different from year 1 and year 0 in logarithm term nation's total output of a country divided by the number of people, post-adjusted inflation. The calculated data suitable to represent the country economic growth. divided by population of a country as a result it is the alternative method to compare economic indicators like GDP for countries with varies sizes of population. According to Kitov, Kitov and Dolinskaya (2009), a lower real GDP per capita is known as a significant deceleration in nation's economy, *ceteris paribus*.

3.7.2 Exchange Rate Stability index (ERS)

Exchange rates represents the value of home country's currency in relation to the base country's currency value, and the rates are fluctuated between the countries. However, when the monetary authorities fixed their own's currency, the fluctuation of currency can be solved, in order to compute exchange rate stability, the yearly standard deviations of the monthly log-change in the exchange rate between the home and base country are comprised in the formula:

$$ERS = \frac{0.01}{0.01 + StDev(\Delta \log(\text{exchange rate}))}$$

By standardize the index between 1 and 0. Greater values of ERS represents greater stability of exchange rate in contrast to currency of the base country (Aizenman, Chinn & Ito, 2008; 2010).

3.7.3 Monetary Independence index (MI)

Monetary policy independence is about directing the changes of short-range interest rates, which in turn affects the domestic investments and savings balance and monetary developments. (Montoya, &Buti, 2019). According to Aizeman, Chinn & Ito (2008; 2010), the degree of monetary independence is defined as the reciprocal of the yearly correlation of monthly money market interest rate in home country j, and base country i.

The monetary independence index constructed as:

$$MI = 1 - \frac{(\text{corr } i_i, i_j) - (-1)}{1 - (-1)}$$

The calculated maximum and minimum values are 1 and 0, individually. If base and home country's interest rate are highly correlated, the MI values of the home country would be lower than the country has a low correlation with base country. When a country has higher values of MI index, it represents greater monetary policy independence. Based on Shamaugh (2004), the home country's monetary policy is highly correlated with defined as base country. Base countries are Australia, Belgium, France, Malaysia and others.

3.7.4 Financial Openness Index (FO)

According to Le (2000) indicated that financial openness can also be known as "financial integration" which there is a capital transaction for the specific country without any restriction across all the countries. Financial openness

can be view as a condition where current administrative and the market-based barriers on capital movement across the frontier have been eliminated.

Besides, financial openness can also be defined as the restriction of the financial market of a country to other countries have been removed. In a sense that the residents are able to conduct all the financial activities in its local market, which is known as financial market openness and financial activities admission. Besides, it also enables the public and local organizations to involve in the global financial market activities. There is seven components that included in financial openness which are capital account openness, share market openness, American Depository Receipt and national fund issuance, reformation of bank, privatization, capital flow and Foreign Direct Investment (Yu, 2014).

Furthermore, FO index is determining the strength of capital controls which its degree is associated with the other restrictions on global transaction.

The index of financial openness constructed as:

$$SHAREk_{3,t} = \frac{k_{3,t} + k_{3,t-1} + k_{3,t-2} + k_{3,t-3} + k_{3,t-4}}{5}$$

Higher of FO indicates that the country has more open to carry out the capital transaction with another countries. From this formula, the series has a mean of zero. However, the k_3 variable represent the restrictions on capital account transactions.

From the formula, people may hassle that FO index is only to determine the growth of capital controls but not the strength of capital controls. It is because it does not reflect the rigorous of restrictions on international transaction directly, but to the other existing restrictions. Nevertheless, the measurement for the strength of capital controls can be replace by the measurement for the growth of capital controls by looking at the country with an open capital account. However, there is still limit the capital flow through restrict on the transaction of current account or other systems such as multiple exchange rates and requirements to surrender export proceeds (Chinn & Ito, 2008).

3.7.5 International Reserve per RGDP (IR)

International Reserves as known as Foreign currency reserves are those foreign assets retained by a country's monetary authorities for the purposes of fixed the nation's exchange rate, boosting the export and economic growth of a country, international reserve also provided liquidity when the country facing the economic crisis (Amadeo, 2019). Many authorities may hold the global currencies such as, U.S. dollar, Euro dollar and British Pound, not only the currency they will also hold gold and some special drawing rights.

The formula to calculate this by using:

$$\frac{IR_t}{RGDP_t}$$

3.7.6 Financial Development index (FD)

Financial development occurs when financial instruments, financial market as well as financial intermediaries, reduce without necessarily get rid of the cost of accessing the information, the cost of executing contracts and the costs of transaction involve (Levine, 2004). As a result, it can provide a better way by contributing financial purposes. Most empirical literature approximates financial development by the measure financial depth which is ratio of domestic credit to private sectors to GDP or stock market capitalization to GDP as a proxy variable (Rajan and Zingales, 1998; Berglof and Bolton, 2002; Kenourgios and Samitas, 2007). Nevertheless, these instrumental variables do not consider of the multidimensional nature for country's financial development complexity, in the sense that financial depth is not only vital feature to measure financial development, but also included the access, stability, and efficiency of financial systems

(Svirydzenka, 2016). Financial Development (FD) index captures 4 characteristics of financial system (depth, access, stability, and efficiency) in countries financial sector which is financial institutions and markets. It represents FD index as a variable is more comprehensively compared than the previous studies' variable. Higher FD grade might not necessarily be a good sign, but may instead specify that a country's financial system is overextended beyond its structural and regulatory abilities, with negative consequences for growth and stability. Calculation of FD index as below:

$$FI_j = \sum_{i=1}^n w_i I_i \quad ; \quad FM_j = \sum_{i=1}^n w_i I_i$$

where FI_j and FM_j stand in turn for financial institutional and financial market depth, access and efficiency.

$$FI = \sum_{j=1}^n w_j FI_j \quad ; \quad FM = \sum_{j=1}^n w_j FM_j$$

$$FD = w_{FI} FI + w_{FM} FM$$

Where w_{FI} is the weightage of nation's financial institution and w_{FM} is the weightage of country's financial market. FI, FM, and FD indices are again renormalized, so that range is between 0 and 1.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

This chapter will be covered the entire data results and interpretation. There is total number of 149 countries from the sample period year 1981 to 2017, the selected countries were differentiated into 4 income level, High Income – 50 countries, Upper-middle Income – 43 countries, Lower-middle – 36 countries and Low Income – 20 countries. In section 4.1 is panel unit root result and interpretation the unit root test to be used is Levin, Lin, and Chu (LLC), Im, Pesaran, and Shin (IPS) as well as Fisher Augmented Dickey Fuller (Fisher ADF). In section 4.2 examines and explanation statistical and specification test for the selected sample such as Poolability F test, Lagrange Multiplier test and Hausman test.

4.1 Panel Unit Root Test

Table 4.1 Panel Unit Root Test Result (In Level)

Variables	LLC Test		IPS Test		Fisher ADF Test	
	Constant	Constant with trends	Constant	Constant with trends	Constant	Constant with trends
Growth	-29.421***	-28.198***	-29.358***	-21.317***	1504.385***	1297.196***
ERS	-7.566***	-9.034***	-17.902***	-16.804***	855.493***	883.547***
MI	-5.066***	-32.649***	-14.138***	-13.491***	790.851***	687.836***
FO	-106.935***	-170.116***	-43.108***	-37.142***	1211.093***	967.048***
IR	5.882	1.379	9.115	0.005	192.875	343.103**
FD	-4.191***	-1.357*	-0.396	-1.180	323.702	349.709**

Note: *, **, and *** denotes that the rejection of the null hypothesis of non-stationary at 10%, 5%, and 1% significant level respectively.

As refer to Table 4.1, Levin-Lin-Chu (LLC) test for those selected countries with data duration from year 1981 to year 2017, the panel unit root null hypothesis of LLC test in level form with constant without trends is rejected for Economic Growth, Exchange Rate Stability, Monetary Independence, Financial Openness, as well as Financial Development at significance level of 1%. On the other hand, result of LLC with constant with and without trends, panel unit root test null hypothesis of International Reserves that has become non-rejection. While other variables remain same decision in both constant without trends and with trends except the null hypothesis of Financial Development will only be rejected at 10% significance level in constant with trends.

In Im, Pesaran and Shin (IPS) test, at the panel unit root test level form of constant without trends for Economic Growth, Exchange Rate Stability, Monetary Independence and Financial Openness has shown as rejection of null hypothesis at 1% significance level except In International Reserves and Financial Development which shown a non-rejection on unit root test null hypothesis. On the other hand, with the presence of time trends, only International Reserves and Financial Development that was non-rejected null hypothesis in intercept with trends. However, other variables remain the same decision in both constant without trends and with trends.

In Fisher Augmented Dicky-Fuller (ADF) test, in level form with absence of time trend for the variables of Economic Growth, Exchange Rate Stability, Monetary Independence and Financial Openness are stationary at 1% of significance level. However, there is non-stationary variables of International Reserve and Financial Development. Besides that, result of Fisher ADF with constant with trends, the panel unit root test null hypothesis of International Reserves and Financial Development that was non-rejected firstly in constant without trends has become rejection in constant with trends at 1% and 5% of significance level respectively.

Table 4.2 Panel Unit Root Test Result (First Difference)

Variables	LLC Test		IPS Test		Fisher ADF Test	
	Constant	Constant with trends	Constant	Constant with trends	Constant	Constant with trends
Growth	-57.821***	-47.574***	-62.439***	-48.894***	3240.582***	3360.393***
ERS	-52.532***	-40.675***	-57.630***	-44.060***	2741.152***	2694.238***
MI	-28.990***	-16.431***	-42.835***	-30.636***	22.74.165***	1787.662***
FO	-119.919***	-62.800***	-56.027***	-42.458***	2421.722***	1821.980***
IR	-37.418***	-50.201***	-38.386***	-30.736***	1999.500***	1710.250***
FD	-47.046***	-45.607***	-47.063***	-36.690***	2482.925***	2106.973***

Note: *, **, and *** denotes that the rejection of the null hypothesis of non-stationary at 10%, 5%, and 1% significant level respectively.

In Table 4.2 shown after adjustment from level form to first difference form. International Reserve in LLC and IPS test intercept with and without trends after adjusted to first difference is 1% of significant level on rejection of null hypothesis. In Fisher ADF test, the result for post adjustment on constant without trends also implies International Reserve without spurious problem.

In contrast, result of Financial Development shown non-rejection of alternative hypothesis in IPS test on constant with or without trends in level form. Nevertheless, after panel unit root level form adjusted to first difference form, the variable states as stationary variables. Moreover, in Fisher ADF test, the result for Financial Development with constant without trend has also shown as a stationary variable after the it had been adjusted from level form to first difference form.

Besides that, the other variables which is Economic Growth, Exchange Rate Stability, Monetary Independence and Financial Openness are shown with stationary. In sum, exogenous and endogenous variables are stationary in first difference form in all three panel unit root tests which it shows a rejection of panel unit root null hypothesis for all the variables under first difference form.

4.2 Panel Model Estimation

4.2.1 Panel Model Estimation – Which Combination of Policies have Greatest Positive Impact on Countries Economic Growth

From Table 4.3 to Table 4.7 shows result of panel model estimation along with different type of income level for countries as well as the overall result. There are three models being applied in this study which are Pooled Ordinary Least Squares Model (POLS), Fixed Effect Model (FEM) as well as Random Effect Model (REM). Besides, takes autocorrelation and heteroscedasticity into consideration, there is an extension test of robust standard error checking for each model. Furthermore, specification test is being used in the panel model estimation with the purpose of determine which model is most fitting model being applied.

Based on Table 4.3 shows that the specification test for Poolability test indicates there is a rejecting null hypothesis at 1% significance level, therefore FEM is preferable to apply in the model since the null hypothesis for Poolability test is POLS model is preferable. Besides, result from Breusch-Pagan Lagrange Multiplier (BPLM) test shows a rejection of null hypothesis at 1% significance level, therefore REM is preferable to apply in the model. The last specification test is the Hausman test where there is also a rejection of null hypothesis at 1% significance level. Hence FEM is preferable to apply to the model instead of REM since the null hypothesis for Hausman test is REM is preferable. Thus, FEM is the most appropriate model to apply in the panel model estimation. According to the Research objective 1, which is to investigate which combination brings highest positive impact to countries economic growth.

As refer to FEM column, constant variable, IR and the combination policies of FO and MI (FO*MI) shows significant at 1% to the model with a coefficient value of 1.784, 3,739 and -4.084 respectively. Besides, the MI variable is significant at 5% with -2.455 coefficient value while ERS

significant at 10% with a coefficient value of 1.705. As an additional information, positive coefficient value denotes a positive impact to the economic growth while a negative coefficient value denotes a negative impact to economic growth. The remaining variables shows an insignificant outcome. However, in order to take into consideration of autocorrelation and heteroscedasticity, robust standard error checking must take into consider. The result shows that the coefficient value remain the same for all the variables after the robust standard error checking but there is a change on the standard error as well as the significance level. The significance level for MI had changed from 5% to 10% after robust standard error checking while the combination policies of FO and MI (FO*MI) changes from 1% to 5%. Besides, the IR variable that originally significant to the dependent variable had become insignificant after the robust standard error checking while the other variables remain the same result.

As refer to Table 4.3, result shown combination policies of financial openness and monetary independence (FO*MI) in the FE model has a significant relationship with the economic growth. Therefore, it shows that most of the countries are implementing this policy to boost their economic condition. As taking emerging market countries (EMG) as an example since more than half of the GDP is being occupied by EMGs, these countries have lowered the exchange rate stability since 1980 and a lower monetary independence but pursuing a higher financial openness (Aizenman, Chinn & Ito, 2010).

Based on Table 4.4 indicates the result for high income countries panel model estimation. In specification test showed that p-value for Hausman Test is lesser than 0.01 hence fixed effect model is applicable to the model. The result from the FEM shows that constant variable, MI, combination policies of ERS and MI (ERS*MI), combination policies of FO and MI (FO*MI) as well as IR show a significant result at 1% of significance level. However, the remaining variables show an insignificant result. On the other hand, the result in robust standard error checking almost the same but only the significance level for constant variable, MI, combination policies of ERS and MI as well as combination policies of FO and MI had changed to 10%,

5%, 5% and 10% respectively. Take Japan as an example, since Japan a developed and high-income country, Japan kept the independence of monetary policy and financial openness with applied floating exchange rate (Majumder and Nag, 2017).

Table 4.5 demonstrations result for upper-middle income countries panel model estimation. As refer to the specification test, there is a rejection on null hypothesis for Hausman test since the p-value is lesser than 0.01 while the coefficient value stood at 36.427. Therefore, fixed effect model is preferable to the model. FE model indicated that only ERS is significant at 5% and IR as well as FD is significant at 1%. However, the remaining variables are insignificant to the dependent variable. On the other hand, on the robust standard error checking, the result shows that only ERS significant at 5% and other variables show an insignificant result. Furthermore, there are none of upper-middle countries' policies combination significant to dependent variable, economic growth but only individual variable of ERS. Thailand as an example since this country is categorized an upper-middle income country, exchange rate stability index of Thailand had increased approximately 65.40% from year 2011 to 2017 which this also impact the economic growth of the country increased by 910.13% during the period.

Table 4.6 depicts the result for lower-middle income countries panel model estimation. The specification test indicated Hausman test p-value < 0.10 and coefficient is 14.026, it means the fixed effect model is more apposite to explain instead of random effect model. FE model shows only two variables FO and IR having contribution effect the economic growth, FO and IR significant at 5% and 1%, respectively. Overall, the result illustrations IR have statistically positive influence on economic growth, countries are suggested to hold higher level of international reserve. Thus, Mongolia, one of the country statuses lower-middle country, the holding of international reserve increased form year 2000 to 2011 amounts 43% (International Reserve/ RGDP, %) and financial openness index was changed from 0.69 to 0.77. The economic growth for the country from year 2000 = 0.25% to 2011 = 10.16%.

According to Table 4.7 shows the result for low income countries panel model estimation. In specification test resulted Hausman test p-value > 0.10 and coefficient is 7.273, it means the random effect model is most preferable model. RE model shows there is none of the variables except ERS is significant to the model. ERS significant at 5% in robust standard error checking ERS significant at 10%. In sum, for low countries there is no any combination of policies should be taken to maximize nation economic growth, yet stabilization of country exchange rate shows positive significant to the country economic. The evidence of Chad, the country stability of exchange rate index from 2010 maintain in constant till 2015 at 1, the Chad's economic growth around 7.181%.

Table 4.3: Result of Panel Models Estimates, All Countries

	POLS	FEM	REM	POLS¹	FEM¹	REM¹
Constant	1.794*** (0.668)	1.784** (0.740)	1.794** (0.712)	1.794* (1.749)	1.784* (0.963)	1.794* (0.974)
ERS	1.355* (0.803)	1.705* (0.970)	1.541* (0.887)	1.355 (1.459)	1.705 (1.426)	1.541 (1.301)
FO	-0.865 (0.842)	0.162 (1.004)	-0.098 (0.931)	-0.865 (1.305)	0.162 (1.201)	-0.098 (1.171)
MI	-1.646 (1.146)	-2.455** (1.183)	-2.064* (1.148)	-1.646 (1.386)	-2.455* (1.394)	-2.064 (1.302)
ERS*FO	-1.216 (0.750)	-0.975 (1.026)	-1.210 (0.909)	-1.216 (1.420)	-0.975 (1.405)	-1.210 (1.276)
ERS*MI	0.600 (1.335)	1.960 (1.462)	1.573 (1.390)	0.600 (1.554)	1.960 (1.876)	1.573 (1.660)
FO*MI	4.002*** (1.247)	3.739*** (1.318)	3.620*** (1.271)	4.002** (1.686)	3.739** (1.601)	3.620** (1.503)
IR	-1.566*** (0.432)	-4.084*** (0.664)	-3.309*** (0.526)	-1.566 (1.755)	-4.084 (3.470)	-3.309 (2.314)
FD	0.906* (0.455)	-0.360 (1.052)	0.236 (0.714)	0.906 (0.901)	-0.360 (1.712)	0.236 (0.841)
Specification Test:						
Poolability	-	4.851***	-	-	-	-
BP LM	574.040***	-	-	-	-	-
Hausman	-	-	19.794***	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Table 4.4: Result of Panel Models Estimates, High Income Countries

	POLS	FEM	REM	POLS¹	FEM¹	REM¹
Constant	6.445*** (1.015)	4.753*** (1.231)	5.609*** (1.115)	6.445*** (1.376)	4.753* (2.572)	5.609*** (1.681)
ERS	-5.017*** (1.111)	-2.382 (1.612)	-4.036*** (1.329)	-5.017*** (1.910)	-2.382 (4.593)	-4.036 (2.757)
FO	-4.204*** (1.112)	-2.212 (1.396)	-3.024** (1.253)	-4.204** (1.744)	-2.212 (2.514)	-3.024* (1.808)
MI	-5.405*** (1.800)	-6.623*** (1.876)	-6.166*** (1.816)	-5.405** (2.131)	-6.623** (2.907)	-6.166** (2.471)
ERS*FO	4.442*** (1.031)	2.108 (1.662)	3.357** (1.339)	4.442** (1.938)	2.108 (4.629)	3.357 (2.772)
ERS*MI	3.977*** (1.632)	7.292*** (1.771)	5.919*** (1.697)	3.997* (2.371)	7.292** (2.926)	5.919** (2.692)
FO*MI	5.004*** (1.746)	4.939*** (1.774)	4.948*** (1.731)	5.004** (2.096)	4.939* (2.734)	4.948** (2.319)
IR	-0.631 (0.537)	-2.975*** (0.823)	-2.198*** (0.687)	-0.631 (0.790)	-2.975*** (0.949)	-2.198*** (0.769)
FD	-0.515 (0.564)	-0.988 (0.989)	-0.636 (0.773)	-0.515 (1.076)	-0.988 (1.018)	-0.636 (0.723)
Specification Test:						
Poolability	-	4.760***	-	-	-	-
BP LM	130.723***	-	-	-	-	-
Hausman	-	-	24.012***	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Table 4.5: Result of Panel Models Estimates, Upper-middle Income Countries

	POLS	FEM	REM	POLS¹	FEM¹	REM¹
Constant	0.348 (1.763)	-0.032 (1.929)	0.956 (1.853)	0.348 (1.874)	-0.032 (2.364)	0.956 (2.046)
ERS	5.488*** (2.078)	4.847** (2.406)	4.597** (2.214)	5.488* (2.980)	4.847** (2.423)	4.597* (2.364)
FO	1.997 (2.430)	0.648 (2.561)	0.787 (2.467)	1.997 (2.151)	0.648 (2.505)	0.787 (2.246)
MI	0.520 (2.991)	0.265 (2.988)	0.612 (2.930)	0.520 (2.904)	0.265 (2.717)	0.612 (2.635)
ERS*FO	-3.616* (2.047)	1.350 (2.525)	0.085 (2.310)	-3.616 (2.407)	1.350 (2.049)	0.085 (1.925)
ERS*MI	-5.519 (3.693)	-5.297 (3.798)	-5.425 (3.674)	-5.519 (3.922)	-5.297 (3.299)	-5.425 (3.308)
FO*MI	2.824 (3.737)	2.760 (3.736)	2.554 (3.646)	2.824 (3.300)	2.760 (3.268)	2.554 (3.174)
IR	-5.303*** (0.894)	-15.622*** (1.678)	-8.435*** (1.078)	-5.303* (2.720)	-15.622 (10.205)	-8.435*** (3.240)
FD	2.235 (1.550)	9.058*** (3.039)	2.939 (2.261)	2.235 (3.306)	9.058 (7.842)	2.939 (2.703)

Specification Test:

Poolability	-	5.252***	-	-	-	-
BP LM	135.739***	-	-	-	-	-
Hausman	-	-	36.427***	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Table 4.6: Result of Panel Models Estimates, Lower-middle Income Countries

	POLS	FEM	REM	POLS¹	FEM¹	REM¹
Constant	-0.017 (1.094)	-0.687 (1.217)	-0.571 (1.180)	-0.017 (1.425)	-0.687 (1.407)	-0.571 (1.456)
ERS	0.900 (1.271)	2.181 (1.505)	1.526 (1.378)	0.900 (1.762)	2.181 (2.058)	1.526 (1.798)
FO	2.394 (1.640)	3.993** (1.888)	3.292* (1.744)	2.394 (1.918)	3.993* (2.342)	3.292 (2.055)
MI	-0.261 (1.856)	-0.037 (1.854)	-0.155 (1.825)	-0.261 (1.684)	-0.037 (1.796)	-0.155 (1.665)
ERS*FO	-2.705** (1.246)	-1.556 (1.705)	-2.150 (1.493)	-2.705 (2.089)	-1.556 (2.430)	-2.150 (2.220)
ERS*MI	1.608 (2.277)	0.455 (2.571)	1.385 (2.396)	1.608 (2.382)	0.455 (3.327)	1.385 (2.740)
FO*MI	-1.743 (2.498)	-1.238 (2.557)	-1.794 (2.473)	-1.743 (2.223)	-1.238 (2.630)	-1.794 (2.304)
IR	3.923*** (0.889)	5.128*** (1.477)	4.043*** (1.310)	3.923** (1.771)	5.128*** (1.760)	4.043** (1.636)
FD	5.621*** (1.501)	0.597 (3.022)	4.520** (2.255)	5.621** (2.641)	0.597 (2.872)	4.520** (2.272)

Specification Test:

Poolability	-	4.707***	-	-	-	-
BP LM	133.362***	-	-	-	-	-
Hausman	-	-	14.026*	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Table 4.7: Result of Panel Models Estimates, Low Income Countries

	POLS	FEM	REM	POLS¹	FEM¹	REM¹
Constant	-2.749 (2.284)	-4.173* (2.444)	-3.458 (2.355)	-2.749 (2.459)	-4.173* (2.276)	-3.458** (2.190)
ERS	3.577 (3.048)	7.634** (3.383)	6.345** (3.202)	3.577 (3.205)	7.634** (3.535)	6.345* (3.294)
FO	-0.551 (3.166)	1.971 (3.643)	1.004 (3.313)	-0.551 (4.133)	1.971 (4.491)	1.004 (4.311)
MI	1.703 (4.310)	5.207 (4.241)	3.847 (4.173)	1.703 (3.668)	5.207 (3.213)	3.847 (3.332)
ERS*FO	-2.735 (3.078)	-4.370 (4.003)	-4.108 (3.540)	-2.735 (4.419)	-4.370 (5.798)	-4.108 (4.959)
ERS*MI	0.290 (5.741)	-5.347 (5.663)	-3.691 (5.590)	0.290 (4.654)	-5.347 (4.942)	-3.691 (4.845)
FO*MI	4.491 (5.587)	-0.648 (5.935)	1.181 (5.653)	4.491 (5.134)	-0.648 (5.952)	1.181 (5.646)
IR	2.106 (1.373)	0.799 (1.571)	1.078 (1.502)	2.106** (0.919)	0.799 (1.136)	1.078 (0.966)
FD	3.502 (2.692)	-1.571 (6.799)	1.383 (4.766)	3.502 (2.808)	-1.571 (7.184)	1.383 (2.471)
Specification Test:						
Poolability	-	3.700***	-	-	-	-
BP LM	31.155***	-	-	-	-	-
Hausman	-	-	7.273	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Where C = Constant; ERS = Exchange rate stability; FO = Financial Openness; MI = Monetary Independence; IR = International reserve per RGDP per-capita; FD = Financial development.

4.2.2 Panel Model Estimation – Which Combination of Policies have Greatest Impact on Countries Economic Growth Take in Consideration of International Reserve?

From Table 4.8 to Table 4.12 indicated the result for all countries panel model estimation which included interaction of international reserve. Based on Research objective 2, to investigate which combination brings highest positive impact to countries economic growth with existence of international reserve. In Table 4.8 after performed specification test result shows, fixed effect model is most appropriate to use on this interpretation since Hausman Test p value < 0.01 . According to FEM column, ERS and IR shows significant at 1% to the model, FO significant at 5%, the international reserve interaction with the combination policies ERS & FO (IR*ERS*FO) significant at 10%. The other variables such as MI, IR*ERS*MI, IRS*FO*MI and FD shows insignificant result. Nevertheless, the discussed variables are significant, but result on robust standard error expect ERS significant, the others are insignificant. There is a constraint to achieve high economic growth on holding large volume of international reserve to handling either of combination on macroeconomic policies, it might bring negative impacts on country economy (Dorrucci et.al, 2006; Mansour. 2014).

Table 4.9 represents high income countries panel model estimation. According to Hausman test statistic, the p-value less than 0.01, rejecting null hypothesis. In FEM column, MI significant at 1% with positive impact to economic growth, however, IR at 5% with negative effect to economic growth, the remaining variables resulted insignificant. It again to proof that the holding on higher level of international reserve might costly over time and inflationary pressure to country's economy. Countries with greater degree of monetary independence experience a higher economic growth and reduce output volatility, result consistent with the hypothetical estimations of Mishkin and Schmidt-Hebbel (2007), countries that adopt inflation targeting policy, are one of the methods increasing monetary independence.

In reference to Table 4.10 indicates that upper-middle income countries panel model estimation. Hausman test result shows fixed effect model is more proper representing this model. There are 4 variables significant whereas the remaining variables insignificant to economic growth. ERS and FO significant at same level of 10%, FD and IR significant at 1%, yet coefficient of international reserve -18.832 means a negative relationship with economic growth. Result for robust standard error only FO significant at 10%, IR remain negative effect to economic growth but insignificant. In sum, greater the financial integration carried positive impacts on upper-middle income countries economic growth.

According to Table 4.11, it shows that lower-middle income countries panel model estimation. Based on Hausman specification test p-value is less than 10% means FEM is an appropriate model to explain for this set of countries. Statistical result shows ERS, FO and IR are positive effects and significant at 1% to economic growth. There is long-run negative impact between interaction term for international reserve with combination policies exchange rate stability and financial integration ($IR*ERS*FO$) and economic growth but not statistically significant. The other variables neither of them significant to economic growth.

As per Table 4.12 illustration that low income countries panel model estimation. The specification test result shown Hausman ($p\text{-value} > 0.01$) do not reject null hypothesis, random effect model to be used on this set of countries. The result unexpectedly same as Table 4.7, there is only 1 variable (ERS) significant at 1%, other variables shows insignificant. The greater the degree of exchange rate stability index, the greater the impacts on economic growth. Conclusion, from Table 4.8 to 4.12, there are some constraints on holding more international reserve, there are limited group of countries shows the positive impacts and interaction with either one of the macroeconomic policies, most of the resulted shown a negative impact on holding high volume of international reserve.

Table 4.8: Result of Panel Models Estimates, All Countries

	POLS	FEM	REM	POLS¹	FEM¹	REM¹
Constant	1.278*** (0.435)	1.195** (0.533)	1.294*** (0.495)	1.278 (0.991)	1.195 (0.815)	1.294 (0.921)
ERS	1.028*** (0.307)	1.652*** (0.436)	1.355*** (0.380)	1.028 (0.667)	1.652** (0.751)	1.355** (0.628)
FO	-0.169 (0.291)	0.918** (0.447)	0.439 (0.377)	-0.169 (0.608)	0.918 (0.670)	0.439 (0.567)
MI	0.745 (0.542)	0.706 (0.578)	0.764 (0.556)	0.745 (0.778)	0.706 (0.672)	0.764 (0.670)
IR*ERS*FO	-1.695 (1.520)	3.736* (2.175)	1.398 (1.834)	-1.695 (3.015)	3.736 (5.247)	1.398 (3.489)
IR*ERS*MI	-1.110 (3.097)	1.136 (3.492)	0.255 (3.282)	-1.110 (4.953)	1.136 (5.671)	0.255 (5.272)
IR*FO*MI	7.715*** (2.691)	1.387 (3.253)	3.497 (3.010)	7.715* (4.460)	1.387 (4.150)	3.497 (3.638)
IR	-2.267** (0.889)	-5.534*** (1.088)	-4.357*** (0.948)	-2.267 (4.020)	-5.534 (6.373)	-4.357 (4.561)
FD	0.444 (0.441)	-1.249 (1.023)	-0.433 (0.692)	0.444 (0.831)	-1.249 (1.720)	-0.433 (0.769)
Specification Test:						
Poolability	-	4.876***	-	-	-	-
BP LM	565.468***	-	-	-	-	-
Hausman	-	-	24.937***	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Table 4.9: Result of Panel Models Estimates, High Income Countries

	POLS	FEM	REM	POLS¹	FEM¹	REM¹
Constant	2.869*** (0.641)	1.532** (0.713)	2.145*** (0.694)	2.869*** (0.933)	1.532** (0.757)	2.145** (0.847)
ERS	-0.808** (0.386)	0.609 (0.638)	-0.266 (0.500)	-0.808 (0.576)	0.609 (0.889)	-0.266 (0.587)
FO	0.128 (0.408)	0.739 (0.576)	0.551 (0.497)	0.128 (0.874)	0.739 (0.978)	0.551 (0.820)
MI	0.271 (0.627)	1.748*** (0.677)	1.176* (0.651)	0.271 (0.841)	1.748** (0.855)	1.176* (0.833)
IR*ERS*FO	1.693 (1.922)	3.714 (2.623)	3.269 (2.250)	1.693 (2.623)	3.714 (2.537)	3.269 (2.327)
IR*ERS*MI	-5.045 (4.029)	-0.265 (4.367)	-2.377 (4.181)	-5.045 (5.055)	-0.265 (4.810)	-2.377 (4.677)
IR*FO*MI	5.239* (3.101)	-1.508 (3.705)	1.428 (3.457)	5.239 (4.316)	-1.508 (4.676)	1.428 (4.330)
IR	-1.494 (1.481)	-3.988** (1.870)	-3.450** (1.673)	-1.494 (1.898)	-3.988* (2.060)	-3.450* (1.747)
FD	-1.113** (0.553)	-1.540 (1.003)	-1.191 (0.765)	-1.113 (1.017)	-1.540 (1.067)	-1.191* (0.683)
Specification Test:						
Poolability	-	4.722***	-	-	-	-
BP LM	150.140***	-	-	-	-	-
Hausman	-	-	23.465***	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Table 4.10: Result of Panel Models Estimates, Upper-middle Income Countries

	POLS	FEM	REM	POLS¹	FEM¹	REM¹
Constant	3.249*** (1.111)	1.626 (1.360)	2.949** (1.270)	3.249 (2.121)	1.626 (1.583)	2.949 (2.101)
ERS	1.325* (0.757)	2.048* (1.086)	1.326 (0.927)	1.325 (1.516)	2.048 (1.495)	1.326 (1.406)
FO	0.424 (0.840)	1.762* (1.058)	1.491 (0.954)	0.424 (1.120)	1.762* (1.015)	1.491 (0.966)
MI	-2.992** (1.445)	-2.189 (1.511)	-2.215 (1.449)	-2.992 (2.074)	-2.189 (1.848)	-2.215 (1.786)
IR*ERS*FO	-5.514 (4.581)	4.796 (5.705)	0.877 (4.948)	-5.514 (3.979)	4.796 (7.786)	0.877 (2.577)
IR*ERS*MI	7.018 (8.287)	6.225 (9.557)	8.534 (8.589)	7.018 (15.570)	6.225 (22.400)	8.534 (18.964)
IR*FO*MI	17.164** (7.370)	6.347 (8.192)	5.900 (7.739)	17.164** (7.595)	6.347 (8.785)	5.900 (7.058)
IR	-8.919*** (2.042)	-18.832*** (2.643)	-11.725*** (2.152)	-8.919 (6.348)	-18.832 (15.944)	-11.725 (7.358)
FD	2.289 (1.550)	8.795*** (3.037)	2.816 (2.269)	2.289 (3.261)	8.795 (7.704)	2.816 (2.677)
Specification Test:						
Poolability	-	5.280***	-	-	-	-
BP LM	139.039***	-	-	-	-	-
Hausman	-	-	35.804***	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

THE TRILEMMA CONSTRAINT: WILL INTERNATIONAL RESERVE
OR FINANCIAL DEVELOPMENT BREAKS THE RULE?

Table 4.11: Result of Panel Models Estimates, Lower-middle Income Countries

	POLS	FEM	REM	POLS ¹	FEM ¹	REM ¹
Constant	-0.241 (0.742)	-0.964 (0.909)	-0.928 (0.851)	-0.241 (1.264)	-0.964 (1.298)	-0.928 (1.295)
ERS	1.295** (0.536)	2.611*** (0.640)	2.193*** (0.598)	1.295 (0.970)	2.611** (1.085)	2.193** (0.993)
FO	0.744 (0.577)	2.465*** (0.818)	1.567** (0.705)	0.744 (0.996)	2.465** (1.180)	1.567 (0.970)
MI	0.154 (0.994)	0.227 (1.042)	0.252 (1.000)	0.154 (1.162)	0.227 (1.247)	0.252 (1.150)
IR*ERS*FO	-11.846** (5.226)	-6.310 (7.370)	-11.489* (6.244)	-11.846* (6.045)	-6.310 (7.423)	-11.489** (5.319)
IR*ERS*MI	0.241 (5.874)	-9.232 (6.379)	-4.777 (6.074)	0.241 (6.481)	-9.232 (7.253)	-4.777 (6.485)
IR*FO*MI	1.642 (8.684)	6.422 (2.439)	5.418 (9.021)	1.642 (9.295)	6.422 (10.478)	5.418 (9.147)
IR	6.293*** (2.155)	8.663*** (2.439)	7.471*** (2.284)	6.293** (2.680)	8.663*** (3.247)	7.471** (2.936)
FD	5.495*** (1.472)	0.480 (3.009)	4.403** (2.238)	5.495** (2.656)	0.480 (2.731)	4.403* (2.342)
Specification Test:						
Poolability	-	4.686***	-	-	-	-
BP LM	135.795***	-	-	-	-	-
Hausman	-	-	14.056*	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Table 4.12: Result of Panel Models Estimates, Low Income Countries

	POLS	FEM	REM	POLS¹	FEM¹	REM¹
Constant	-2.979** (1.490)	-1.791 (1.782)	-1.787 (1.699)	-2.979 (1.991)	-1.791 (1.962)	-1.787 (1.789)
ERS	3.696*** (1.007)	4.081*** (1.522)	3.934*** (1.340)	3.696* (1.917)	4.081* (2.123)	3.934** (1.892)
FO	-0.407 (1.484)	-1.164 (2.092)	-1.121 (1.773)	-0.407 (1.729)	-1.164 (1.978)	-1.121 (1.597)
MI	2.627 (2.171)	1.702 (2.172)	1.651 (2.134)	2.627 (1.973)	1.702 (2.009)	1.651 (1.994)
IR*ERS*FO	-16.026 (11.255)	-8.283 (16.753)	-11.953 (13.987)	-16.026* (9.164)	-8.283 (12.210)	-11.953 (10.647)
IR*ERS*MI	-7.113 (12.440)	-3.573 (12.712)	-3.982 (12.379)	-7.113 (8.933)	-3.573 (9.027)	-3.982 (8.674)
IR*FO*MI	31.276 (22.605)	22.321 (24.275)	26.621 (22.952)	31.276* (16.558)	22.321 (24.366)	26.621 (21.720)
IR	2.188 (3.552)	0.227 (3.714)	0.468 (3.614)	2.188 (2.827)	0.227 (2.748)	0.468 (2.635)
FD	3.196 (2.691)	-1.352 (6.799)	0.877 (4.943)	3.196 (2.647)	-1.352 (7.825)	0.877 (2.993)
Specification Test:						
Poolability	-	3.535***	-	-	-	-
BP LM	28.762***	-	-	-	-	-
Hausman	-	-	2.439	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Where C = Constant; ERS = Exchange rate stability; FO = Financial Openness; MI = Monetary Independence; IR = International reserve per RGDP per-capita; FD = Financial development.

4.2.3 Panel Model Estimate – Which Combination of Policies have Greatest Impact on Countries Economic Growth Take in Consideration of Financial Development?

From Table 4.13 to Table 4.17 presented the outcome for all countries panel model estimation which included interaction of financial development. Based on Research objective 3, to investigate which combination brings highest positive impact to countries economic growth with existence of financial development. The specification test resulted from the Table 4.13 shows that the p-value for Hausman test is lesser than 0.01, thus fixed effect model is preferable to the model. Therefore, as refer to the FE model, ERS, FO, the financial development interaction with the combination of ERS and FO (FD*ES*FO) as well as IR show a significant result at 1% and financial development interaction with the combination of ERS and MI (FD*ERS*MI) shows a significant result at 5%. The remaining variables show an insignificant result with the economic growth. However, the result in robust standard error checking shows that the ERS, FO, financial development interaction with ERS and FO, financial development interaction with ERS and MI remain significant with the dependent variable, however the IR had an insignificant result after the robust standard error checking while the other variable remained the same result after robust standard error checking. In short, Table 4.13 illustrated most of the countries are preferred to implement either two of the combination policies, stabilized exchange rate with financial openness and stabilized exchange rate with monetary independence together interact with the financial development in order to boost their economic since there is a significant positive impact to the economic growth. Besides, the exchange rate stability is able to boost the economic growth when the economy is highlighted by moderate level of financial development (Aizenmann, Chinn & Ito, 2010).

In reference to Table 4.14 displays that the High income countries panel model estimation. Besides, the Hausman test outcome indicates the fixed effect model is more appropriate to apply in the model. There are few variables which are significant to the dependent variable which are constant

variable, MI, financial development interaction with ERS and MI (FD*ERS*MI), IR as well as FD at 10%, 10%, 1%, 1% and 5% of significance level respectively. The remaining variables resulted an insignificant relationship with the economic growth of high income countries. However, as the result extended to robust standard error checking, it illustrates that only the financial development interaction with ERS and MI as well as IR has a positive significant relationship against the economic growth at 1% of significance level while the remaining variables show an insignificant result. In short, it is applicable to those high income countries to boost their economic since the variable of FD*ERS*MI had financial stability also can be served as a fourth objective in policy dimension (Aizenmann, 2010).

Table 4.15 represents upper-middle income countries panel model estimation. Based on the Hausman test, since the p-value is below 0.01, thus fixed effect model is applicable in this model. In FEM column indicates that only IR and FD are significant at 1% and 5% respectively and the remaining variables show an insignificant relationship with the dependent variable. Besides, as the testing extended to robust standard error checking, it shows that only ERS is significant at 10% and the remaining variables had an insignificant result.

According to Table 4.16 shows the lower-middle income countries panel model estimation. As refer to the Hausman test, it shows that the p-value is lesser than 0.05 and therefore fixed effect model is appropriate to apply to the model. As refer to the FE model, it indicates that the ERS, FO and IR are significant at 10%, 5% and 1% respectively. The other variables resulted an insignificant relationship to the dependent variable. However, as the robust standard error checking resulted that only IR is positively significant to the economic growth at 1% significance level and remaining variables are insignificant.

Based on Table 4.17 shows that the low income countries panel model estimation. The Hausman test for this model shows that the p-value is lesser than 0.01 and the null hypothesis should be rejected. Therefore, fixed effect

model is an option to determine whether there is a significant relationship between the explanatory variables and dependent variable. As the FE model shows that only ERS and financial development interaction with FO and MI (FD*ERS*MI) are significant at 1% and 10% respectively while the remaining variables are insignificant to the economic growth for low income countries. However, as the result of robust standard error checking for FE model shows that only ERS is positively significant to the economic growth at 5% significance level and the remaining variables shows an insignificant result.

In short, by summarizing the result from Table 4.13 to 4.17, there is only those countries with high income are able to achieve the objective with the aim of boost the economic growth when the countries implementing the combination policies of exchange rate stability and monetary independence when interact together with financial development. However, the countries with upper-middle income, lower-middle income as well as low income still unable to achieve the objective to boost the economic by implementing trilemma combination together with financial development.

Table 4.13: Result of Panel Models Estimates, All Countries

	POLS	FEM	REM	POLS¹	FEM¹	REM¹
Constant	1.035* (0.567)	0.811 (0.696)	1.079* (0.645)	1.035 (0.986)	0.811 (0.897)	1.079 (0.934)
ERS	1.132*** (0.432)	1.961*** (0.600)	1.614*** (0.527)	1.132 (0.992)	1.961** (0.825)	1.614** (0.750)
FO	0.836** (0.393)	1.945*** (0.586)	1.381*** (0.497)	0.836 (0.725)	1.945*** (0.731)	1.381** (0.625)
MI	-0.125 (0.683)	-1.001 (0.746)	-0.600 (0.707)	-0.125 (0.887)	-1.001 (0.885)	-0.600 (0.801)
FD*ERS*FO	-3.446*** (0.995)	-3.722*** (1.406)	-3.423*** (1.242)	-3.446* (1.784)	-3.722** (1.458)	-3.423*** (1.324)
FD*ERS*MI	4.317* (2.584)	8.383** (3.353)	6.421** (3.024)	4.317 (5.768)	8.383* (4.393)	6.421 (3.958)
FD*FO*MI	0.155 (1.774)	0.485 (2.253)	0.725 (2.070)	0.155 (3.573)	0.485 (2.335)	0.725 (2.411)
IR	-1.548*** (0.442)	-4.378*** (0.672)	-3.433*** (0.532)	-1.548 (1.836)	-4.378 (3.563)	-3.433 (2.340)
FD	1.099 (0.827)	-0.012 (1.335)	0.175 (1.056)	1.099 (1.489)	-0.012 (1.747)	0.175 (1.082)

Specification Test:

Poolability	-	4.903***	-	-	-	-
BP LM	579.710***	-	-	-	-	-
Hausman	-	-	21.865***	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Table 4.14: Result of Panel Models Estimates, High Income Countries

	POLS	FEM	REM	POLS¹	FEM¹	REM¹
Constant	5.177*** (1.154)	2.445* (1.393)	4.027*** (1.277)	5.177*** (1.580)	2.445 (1.789)	4.027** (1.661)
ERS	-2.988*** (0.762)	0.030 (1.161)	-1.841* (0.944)	-2.988*** (1.078)	0.030 (1.951)	-1.841 (1.327)
FO	-0.027 (0.682)	1.276 (0.838)	0.733 (0.759)	-0.027 (1.058)	1.276 (1.401)	0.733 (1.192)
MI	-2.535** (1.213)	-2.329* (1.365)	-2.770** (1.282)	-2.535* (1.514)	-2.329 (1.775)	-2.770* (1.607)
FD*ERS*FO	2.262* (1.249)	-1.377 (1.794)	0.708 (1.542)	2.262 (1.744)	-1.377 (2.325)	0.708 (1.859)
FD*ERS*MI	9.947*** (2.998)	14.045*** (3.431)	13.272*** (3.223)	9.947** (3.968)	14.045*** (4.987)	13.272*** (4.416)
FD*FO*MI	0.521 (2.157)	-0.617 (2.255)	0.107 (2.186)	0.521 (2.792)	-0.617 (3.014)	0.107 (2.892)
IR	-0.794 (0.577)	-3.383*** (0.852)	-2.612*** (0.722)	-0.794 (0.761)	-3.383*** (1.115)	-2.612*** (0.827)
FD	-3.572*** (1.157)	-1.940* (1.506)	-2.931** (1.335)	-3.572** (1.707)	-1.940 (1.593)	-2.931** (1.468)

Specification Test:

Poolability	-	4.983***	-	-	-	-
BP LM	171.146***	-	-	-	-	-
Hausman	-	-	22.292***	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

THE TRILEMMA CONSTRAINT: WILL INTERNATIONAL RESERVE
OR FINANCIAL DEVELOPMENT BREAKS THE RULE?

Table 4.15: Result of Panel Models Estimates, Upper-middle Income Countries

	POLS	FEM	REM	POLS ¹	FEM ¹	REM ¹
Constant	1.556 (1.658)	0.627 (1.841)	1.808 (1.779)	1.556 (1.981)	0.627 (2.152)	1.808 (1.993)
ERS	1.813 (1.221)	2.641 (1.684)	2.034 (1.467)	1.813 (2.541)	2.641* (1.517)	2.034 (1.541)
FO	2.407* (1.436)	1.660 (1.698)	1.582 (1.529)	2.407 (2.109)	1.660 (1.600)	1.582 (1.518)
MI	-1.494 (1.934)	-0.686 (2.006)	-0.725 (1.936)	-1.494 (2.191)	-0.686 (1.952)	-0.725 (1.836)
FD*ERS*FO	-6.298 (4.770)	6.016 (5.925)	2.840 (5.461)	-6.298 (5.323)	6.016 (3.991)	2.840 (3.632)
FD*ERS*MI	2.746 (8.685)	-4.788 (10.323)	-3.045 (9.582)	2.746 (17.354)	-4.788 (8.262)	-3.045 (9.409)
FD*FO*MI	-1.960 (8.682)	1.062 (9.297)	0.382 (8.937)	-1.960* (14.230)	1.062 (8.572)	0.382 (9.537)
IR	-5.332*** (0.903)	-15.749*** (1.684)	-8.573*** (1.087)	-5.332 (2.752)	-15.749 (10.253)	-8.573*** (3.272)
FD	3.261 (2.880)	9.074** (3.723)	3.180 (3.227)	3.261 (3.096)	9.074 (7.722)	3.180 (2.786)

Specification Test:

Poolability	-	5.333***	-	-	-	-
BP LM	141.830***	-	-	-	-	-
Hausman	-	-	36.525***	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Table 4.16: Result of Panel Models Estimates, Lower-middle Income Countries

	POLS	FEM	REM	POLS¹	FEM¹	REM¹
Constant	1.627 (1.118)	-0.590 (1.403)	0.240 (1.289)	1.627 (1.623)	-0.590 (1.984)	0.240 (1.805)
ERS	-0.295 (0.899)	1.891* (1.100)	0.939 (1.013)	-0.295 (1.341)	1.891 (1.712)	0.939 (1.463)
FO	-0.271 (0.898)	3.008** (1.367)	1.186 (1.116)	-0.271 (1.654)	3.008 (2.095)	1.186 (1.740)
MI	-1.347 (1.438)	-0.102 (1.484)	-0.521 (1.402)	-1.347 (1.595)	-0.102 (2.071)	-0.521 (1.837)
FD*ERS*FO	-0.168 (5.623)	-1.402 (6.347)	0.669 (5.996)	-0.168 (9.831)	-1.402 (7.996)	0.669 (8.370)
FD*ERS*MI	12.240 (9.150)	1.878 (9.999)	6.507 (9.572)	12.240 (11.698)	1.878 (14.560)	6.507 (13.316)
FD*FO*MI	2.242 (8.903)	-4.864 (10.574)	-2.567 (9.656)	2.242 (10.193)	-4.864 (13.272)	-2.567 (11.204)
IR	3.729*** (1.121)	5.074*** (1.484)	3.887*** (1.309)	3.729** (1.825)	5.074*** (1.699)	3.887** (1.643)
FD	2.668 (1.627)	1.459 (4.123)	3.593 (3.465)	2.668 (4.138)	1.459 (4.576)	3.593 (3.935)

Specification Test:

Poolability	-	4.787***	-	-	-	-
BP LM	129.987***	-	-	-	-	-
Hausman	-	-	16.090**	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Table 4.17: Result of Panel Models Estimates, Low Income Countries

	POLS	FEM	REM	POLS ¹	FEM ¹	REM ¹
Constant	-1.671 (2.032)	-1.556 (2.494)	-1.401 (2.333)	-1.671 (2.530)	-1.556 (2.071)	-1.401 (1.858)
ERS	2.534 (1.567)	6.068*** (2.330)	5.009** (2.054)	2.534 (2.899)	6.068** (2.679)	5.009** (2.484)
FO	-0.491 (2.153)	-3.018 (2.995)	-2.475 (2.641)	-0.491 (2.769)	-3.018 (4.398)	-2.475 (3.787)
MI	0.782 (3.066)	1.070 (3.200)	0.901 (3.111)	0.782 (2.827)	1.070 (2.197)	0.901 (2.184)
FD*ERS*FO	-18.162 (21.740)	-21.226 (30.904)	-19.712 (26.843)	-18.162 (32.300)	-21.226 (52.370)	-19.712 (41.991)
FD*ERS*MI	19.262 (28.289)	-30.016 (32.158)	-18.660 (30.768)	19.262 (28.173)	-30.016 (22.745)	-18.660 (21.617)
FD*FO*MI	31.932 (33.668)	68.850* (40.989)	58.658 (37.745)	31.932 (24.296)	68.850 (44.138)	58.658 (36.257)
IR	2.067 (1.375)	0.635 (1.572)	0.895 (1.514)	2.067** (0.918)	0.635 (1.118)	0.895 (0.943)
FD	-0.999 (5.085)	-3.881 (8.707)	-1.427 (7.055)	-0.999 (4.353)	-3.881 (8.245)	-1.427 (4.236)
Specification Test:						
Poolability	-	3.812***	-	-	-	-
BP LM	30.356***	-	-	-	-	-
Hausman	-	-	2.321***	-	-	-

Note: Figure in parenthesis are standard error. ¹ Figure in parenthesis are robust standard errors. * depicts significant at 10%; ** depicts significant at 5%; *** depicts significant at 1%. Specification tests to determine whether there are common or non-common intercept on all of the observations' growth and which model are preferable.

Where C = Constant; ERS = Exchange rate stability; FO = Financial Openness; MI = Monetary Independence; IR = International reserve per RGDP per-capita; FD = Financial development.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATION

5.0 Introduction

This chapter describes the work as a whole. It includes the summary of major findings in the first part of this chapter. In addition, this chapter also further describes the implications and limitations of this research through comparison to the empirical results of Chapter 4 and recommendation made to future researchers. Last but not least, the conclusion would provide a rough description of the study.

5.1 Summary of Major Finding

In this research, the research objective 1 is to investigate which combination brings highest positive impact to countries economic growth. As refer to the result of Table 4.4 from Chapter 4, it concludes that there are two combinations bring highest positive impact to countries economic growth in the high income countries. Next, the research objective 2 is to examine which combination brings highest positive impact to countries economic growth with existence of international reserve. As refer to the result from Table 4.8 to Table 4.12, we are unable to make conclusion on it because all variables show insignificant outcome with economic growth. The research objective 3 is to study which combination brings highest positive impact to countries economic growth with existence of financial development. As refer to the result from Table 4.14, it concludes that one combination brings highest positive impact to countries economic growth with existence of financial development.

Table 5.1: Summary of results

	Variable	Coefficient	Relationship
Table 4.4	ERS*MI	7.292**	Positive
	FO*MI	4.939*	Positive
Table 4.14	FD*ERS*MI	14.045***	Positive

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. +/- represent positive or negative, respectively.

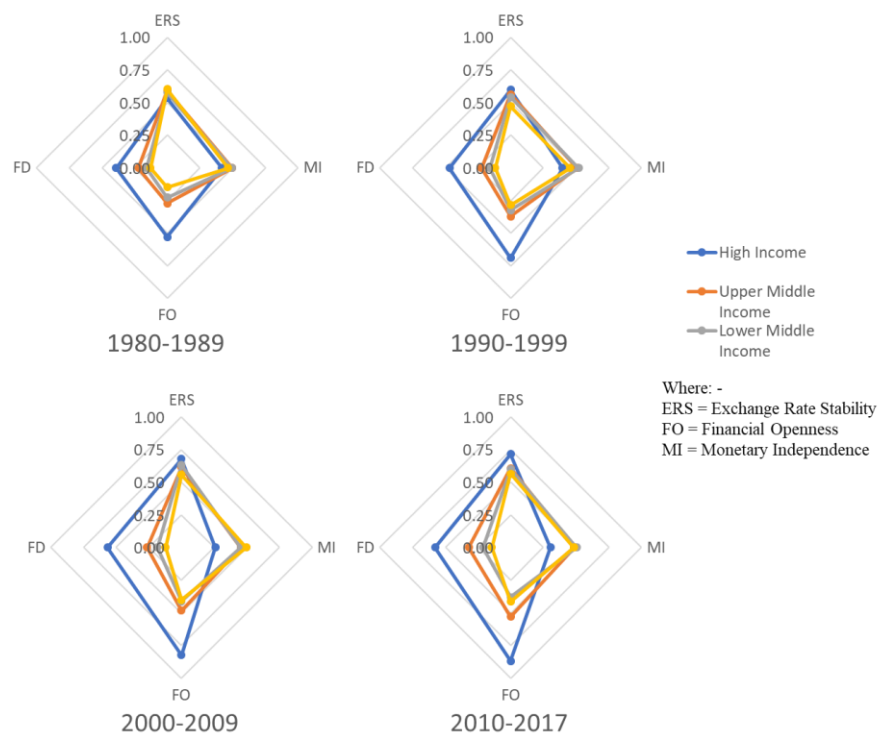
First of all, based on Table 5.1 the summary of results in table 4.4, it reveals that there are two variables have significant and positive effect on economic growth which is combination of ERS and MI and combination of FO and MI in the high-income countries. Thus, this result suggests that countries with high income level have to implement these two combinations of policy to enhance the economic growth. For an example shown by Majumder and Nag (2017), they found that Japan adopted the autonomous monetary policy and financial openness with the quit of exchange rate stability since Japan is a developed and high-income countries to enhance economic growth.

Furthermore, the result also demonstrates that combination of ERS and MI has higher significant level compare to combination of FO and MI. Hence, it is critical to recommend countries with high income can emphasize in this policy combination. When countries maintaining fixed exchange rate, it would reduce the currency uncertainty and transaction costs will be eliminated as the fixed exchange rate is pegging the home currency to another foreign currency (Frankel, 2003). When conducting monetary independence, central bank can implement contractionary policies to reduce the money supply to control the inflation levels and expansionary policy is to stimulate economic activities in response to unemployment during the recession (Kul, Mughal & Rahim, 2012). Therefore, both policies also can be adopted to enhance economic growth. Based on the data we collected, it found that Chile is developed and high income country which increase ERS and MI in order to increase its economic growth. The result also indicates that MI is more significant because two combination of policy also include MI. According to Aizenman & Ito

(2012), countries with high MI will shows low output volatility and result in high economic growth.

In addition, the result in Chapter 4 shows the insignificant result in the policy combinations with existence of international reserve on economic growth. The reason on this result might refer to Dorrucchi et.al (2006); continuous accumulation of the foreign reserve can lead to certain risk and increase the cost. There is a restriction on maintaining rapid economic growth by holding a large amount of foreign reserve in order to handle any mix of macroeconomic policies, which could have a detrimental effect on the economic growth of countries (Mansour, 2014).

Figure 5.1 Average Combination of Trilemma Policy with Interaction of Financial Development



Sources: Chinn-Ito Index and International Monetary Fund (IMF) Database.

Figure 5.1 illustrated average combination of trilemma policy for all income groups with interaction of financial development whereby the variables are normalized in 0 to 1. In chart of year 2010 to 2017, collected data proven that many high and upper middle income countries are more likely adopted exchange rate stability and

financial openness this two policies; lower middle countries are implemented monetary independence and exchange rate stability; lower income countries were used exchange rate stability and monetary independence as their choices. Majority of countries implementing the combination of exchange rate stability and financial openness brought an optimal result, however countries such as upper, lower-middle and low income countries could not achieve objectives, therefore it took another important variable into consideration – Financial Development. Result from table 5.1 shows that only high income countries able to resolve economic growth by picking the competent policies (ERS and MI with FD), we believe that if the countries financial market and institution were highly developed and efficient, those countries can choose the optimal policies to boost countries economic.

Other than that, the table 5.1 show that financial development interaction with ERS and MI ($FD*ERS*MI$) has significant and positive effect on economic growth. There are evidences showed that Austria, Australia, Belgium and Canada are developed and high income countries. Based on result showed by Ito and Kawai (2014), they stated that financial development has negative effect on exchange rate stability and monetary independence. But it is contrast with our result which indicates that financial development has positive effect on exchange rate stability and monetary independence. Based on the result showed by Hagen and Zhou, financial development has positive effect on exchange rate stability which is consistent with our result. From the Table 5.1, it demonstrates that the significant level of combination of ERS and MI increase when interact with financial development. Therefore, the presence of financial development indicates the significant role in enhancing economic growth. According to Kaur & Singh (2014), financial deepening or stability allowed countries to improve economies of scales and increases the marketability of financial markets. Moreover, high developed financial markets will support financial openness in order to reduce output fluctuation as a result economic growth is enhanced (Aizenman, Chinn & Ito, 2008).

5.2 Implication of Study

In this research, we discovered that the impossible trinity can be achieved to become “possible trinity”. The impossible trinity is crucial to consider of country development stage. Hence, the model framework is demonstrated by different country income group such as high income level, upper-middle income level, lower-middle income level as well as low income level. Unlike the previous studies Aizenman et al (2010) exhibited that the emerging market with medium or high degree of financial openness aim to encounter smaller output volatility when they adopt greater exchange rate stability. However, based on Table 4.4 showed that the empirical result on high income country level pursue the exchange rate stability and financial openness does not have any significant effect on output fluctuations. The empirical result that we had conducted showed that there are significant impacts which high income level country pursues the exchange rate stability and monetary independence or financial openness and monetary independence. In this case, the policy makers might be suggested to pursue the combination of exchange rate stability and monetary independence due to this combination has more significant impact at 1% significance level.

In the view of the above, our analysis result showed that the importance of analysing the country stage of development from different income level of countries as the result are apparently be biased if only study the developing and emerging countries. Our findings contribute to a deeper understanding on the different income level of country, the policy makers might adopt different combination of trilemma combination to boost the economic growth as it answered our objective one.

Our research has taken the financial development of the countries as we need to achieve the possible trinity. Based on the Table 4.14 showed that financial development of high income level of countries interacts with exchange rate stability and monetary independence has a positive significant relationship. This result has answered our objective three that the presence of financial development interaction with trilemma combination whether it is able to boost the economic growth. This result indicates that high income level of countries has soundness of financial stability lead to higher exchange rate stability and greater monetary independence.

Hence, the output volatility will be mitigated by well-established financial development in high level income countries. It also indicates that there is an unrestricted of capital inflow or outflow since the financial development is well-established.

Hence, the countries should pay attention and efforts on their own countries' financial development. Therefore, the policy makers just only concentrate on with the trilemma combination of exchange rate stability and monetary independence since well-developed financial development indicates that the countries have free inflow or outflow of capital. Once the financial development is well-developed, the countries have been experiencing greater financial globalization. However, if policy makers just focus on the financial openness in trilemma combination without establish their own countries development. This will result in the countries would experience a financial turbulence. The greater financial openness refers to condition where current administrative and market-based barriers on capital movement across the frontier have been eliminated. If there is a sudden stop of capital inflow and outflow, the countries with the poor-developed financial development unable to behave as a general and individual lender of last resort to ensure the liquidity of the markets. According to Tucker (2014), European Central Bank (ECB) successfully managed financial crisis 2007/08 which the ECB are stable and soundness to ensure the marketability of markets.

In short, the financial development should pay more attention and effort on it instead of financial openness. If financial development of the countries is well-developed that indicates that financial openness can be replaced by financial openness in order to achieve the possible trinity. Other than that, the financial development is more suitable to treat it as fourth dimension from trilemma to quadrilemma instead of international reserve. Since international reserve is a costly option to holding it and there is no any significant effect showed by our empirical result from all income level of countries. Last but not least, the financial development is found to have correlated with international reserve which the greater the financial development, the increase of international reserves significantly (Obstfeld, Shambaugh, & Taylor, 2010). As a result, this is the major reason that the industrial countries hold the low ratio of international reserve due to they able

to borrow externally easily due to the industrial countries have a well-developed financial development (Aizenman, 2013).

5.3 Limitation of Study

After this study, the limitations of the analysis must be established and understood. The limitations of the analysis are the features of the methods and architecture that influenced the results. They limit the generalizability and have an effect on the understanding and reliability of the result. Recognizing limitations is critical because it will enhance the future research.

There were few limitations of study in our research. The availability of data problem is one of them. Due to the data source of financial development (FD) is differentiated with other data which are collected from International Monetary Fund, the FD data provided by IMF start from 1980 onward. Thus, the whole data period used in our thesis only can start from 1980 to 2017 since we decide to collect the data from 1970. Moreover, there is a limitation for us to collect all complete data for all countries because some data of countries are missing in particular period. Due to the availability of data is insufficient to be covered for all countries, therefore, the withdrawal of the countries from the sample the needed.

Besides that, we have adopted the different variable as the proxy of FD in our research which is FD index compared to previous researches. Most of the empirical literature approximates financial development by the measure financial depth which is ratio of domestic credit to private sectors to GDP or stock market capitalization to GDP as a proxy variable. Even though FD index can capture 4 characteristics of financial system (depth, access, stability, and efficiency) in both financial institutions and markets, the coverage of FD index is quite board. We are unable to focus on the particular aspect of financial sector such as stock market, bond market or private-sector credit. It is a limitation for us to make sure that FD index can measure the financial development effectively within the countries when the countries are concentrated in different aspect of financial sector.

In addition, there has been a shortage of journals on the relationship between the combination of trilemma when interact with financial development and economic growth within all countries involved. Most of the journals that we found are study on the impact of financial openness on financial development. In this research, there are limited with lesser evidence relating to the relationships between combination of trilemma when interact with financial development on economic growth. This research makes difficulty for us to find any journals on this relationship through the online source inside UTAR library or other online source because this relationship may not popular for the researchers to study on it.

5.4 Recommendation for Future Research

First of all, this study suggests that researchers intending to investigate this subject in the future can focus on the regional countries. In this research, researchers select the worldwide countries which consist of 149 countries as sample. According to the previous study by Chinn and Ito (2012), they select the Latin America countries as their sample. When focusing on the regional countries instead of worldwide, it contributes to more effective in assessing the effect of independent variable on economic growth to the countries involved. Thus, this research would like to recommend that the researcher can focus on only one of regional countries such as Europe, East Asia and Central Asia due to their behaviours are quite similar as a result the empirical result will be more precise.

Other than that, this study also suggests that researchers can use time-series data on their research. In this research, the researcher applies unbalance panel data in the model. According to Huh, Ji and Park (2016), they only use Fiji which is a small-island as sample in order to conduct this research. When researchers use time-series data to conduct this research, it may show the different result at the different angle. Moreover, researcher can select the home country which is Malaysia. The reason that we choose Malaysia as our cross-sectional sample because we well-known Malaysia's economic, government policy and business structure, law enforcement. Therefore, we are able to add on relevant independent variables to ease our model estimation.

Last but not least, this study would like to suggest further potential research on the matter related to the impact of trilemma combination when interact with financial development on the economic growth of worldwide countries, since research on the relevant subject is very limited. The impact of trilemma combination when interact with financial development is a very interesting variable because it often affects the economic growth. In this research, the result indicates that financial development has a major role to play in achieving possible trinity. Therefore, there would also be further work to be done on this matter so that further discussion can take place between researchers and encourage more people to study on this relationship.

5.5 Conclusion

In the nutshell, Mundell Fleming Framework can be achieved to choose three trilemma policy goals simultaneously. Theoretically, policy makers have to make two out of the three policy goals to boost the economy. However, in practice policymakers will always greedy and try to pursue the greatest value of the indices (Majumder & Nag, 2017). Hence, recently no any countries have successfully challenged the impossible trinity due to complexity between the policy goals for each country. Different combination has different effect for each of the country. For instead, if country choose fixed exchange rate and financial openness which indicated that the country prefers to stabilize their home currency via intervention in order to meet demand for foreign currency; if country choose monetary independence and financial openness which means that central bank had gave up on fixing home currency rate and result in the interest rate will be reduced through the increased the money supply lead to the capital outflow; country choose fixed exchange rate and monetary independence indicates that the central bank had gave up on financial openness which there is no relationship between local interest and foreign interest on local and foreign bond.

Since, different countries have different country development stage and policy goals to achieve, so that the trilemma is hard to achieve simultaneously. In order to challenge this impossible triangle, the policymakers used the degree of flexibility

to achieve trilemma by using international reserve to pursue each of trilemma indexes. Policymakers believe that it has potential impacts on global interest rate, economic growth and etc. International reserve also served as self-mechanism against the potential instability such as financial crisis or speculative attack that caused by financial liberalization. International reserve has the potential impact to achieve possible trinity if the countries holding an unlimited reserve for adopting degree of flexibility. Unfortunately, there is no any countries holding an unlimited foreign reserve and holding exceed the adequacy level of foreign reserve is a costly option which indicates that foreign reserve is not applicable for the long-term period.

Last but not least, since foreign reserve is not applicable for long-term, so what is the most suitable component to challenge impossible triangle? Financial development can be served as the fourth dimension to challenge from impossible trinity to become 'possible trinity'. Based on the empirical result that we have conducted, the result showed that financial development of high income level of countries interaction with exchange rate stability and monetary independence has a positive significant relationship and this result has answered our objective three that it is able to boost the economic growth. High level income countries with stronger financial development that financial markets are capable to clear financial turbulence and the ability of financial intermediaries to provide financial services without any disruption as well as efficient of capital allocation. In other words, our research suggested that policymakers should put more effort on the country's financial development and country development stage so that policymakers can able to manage and monitor another two trilemma components which are monetary independence and exchange rate stability if the country have stable financial development. Besides that, the accumulation of foreign reserve increases upon on the stage of domestic financial development (Rodrik, 2006). If domestic financial development is stronger enough which will result in the foreign reserve increase dramatically so that it allows the policymakers uses the foreign reserve to intervene exchange rate stability and monetary independence.

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