

The Determinant of International Sovereign Bond Financing in
Developing Countries.



Miss Thanatcha Varaputtanon

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Arts in International Economics and Finance
Field of Study of International Economics
FACULTY OF ECONOMICS
Chulalongkorn University
Academic Year 2019
Copyright of Chulalongkorn University

ปัจจัยที่ส่งผลกระทบต่อการออกพันธบัตรรัฐบาลระหว่างประเทศของประเทศกำลังพัฒนา



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
สาขาวิชาเศรษฐศาสตร์และการเงินระหว่างประเทศ สาขาวิชาเศรษฐศาสตร์ระหว่างประเทศ

คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

ปีการศึกษา 2562

ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Thesis Title	The Determinant of International Sovereign Bond Financing in Developing Countries.
By	Miss Thanatcha Varaputtanon
Field of Study	International Economics and Finance
Thesis Advisor	Assistant Professor Dr. YONG YOON

Accepted by the FACULTY OF ECONOMICS, Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of Arts

----- Dean of the FACULTY OF ECONOMICS
(Associate Professor Dr. SITTIDAJ PONGKIJVORASIN)

THESIS COMMITTEE

----- Chairman
(Associate Professor Dr. Chantal Herberholz)
----- Thesis Advisor
(Assistant Professor Dr. YONG YOON)
----- Examiner
(Assistant Professor NIPIT WONGPUNYA)
----- External Examiner
(Dr. Tientip Subhanij)

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

ธนัชชา วรพุทธานนท์ : ปัจจัยที่ส่งผลกระทบต่อ การออกพันธบัตรรัฐบาลระหว่างประเทศของ ประเทศกำลังพัฒนา. (The Determinant of International Sovereign Bond Financing in Developing Countries.) อ.ที่ปรึกษาหลัก : ผศ. ดร.ยง ยูน

ในการพัฒนาประเทศ รัฐบาลต่างต้องการเงินทุนในการจัดทำโครงการต่างๆของรัฐ รัฐบาลสามารถจัดหาแหล่งเงินทุนผ่านหลายช่องทาง อาทิเช่น การจัดเก็บภาษี การกู้ยืมผ่านธนาคารระหว่างประเทศ หรือการออกพันธบัตรรัฐบาล เป็นต้น สำหรับประเทศกำลังพัฒนา การออกพันธบัตรรัฐบาลระหว่างประเทศอาจเป็นอีกหนึ่งช่องทางในเพิ่มรายได้ให้กับประเทศ ใน การศึกษาวิจัยนี้ได้ศึกษาปัจจัยที่ส่งผลกระทบต่อ การออกพันธบัตรรัฐบาลระหว่างประเทศของประเทศกำลังพัฒนา 36 ประเทศ โดยใช้ข้อมูลจาก Bloomberg Terminal ในการเก็บรวบรวมข้อมูลการออกพันธบัตรรัฐบาลระหว่างประเทศระหว่างปี 1996 ถึง 2016 การศึกษาวิจัยนี้ได้นำเอา logit-fixed effect model มาใช้ในการดำเนินการศึกษาวิจัยที่ได้รับ การเสนอผ่านรายงานของ S&P (2014) ว่าเป็นปัจจัยที่ส่งผลกระทบต่อ การออกพันธบัตรระหว่างประเทศ ในห้าปัจจัยที่ กล่าวถึง พบว่า ความมีประสิทธิภาพของรัฐบาล (Government effectiveness) ส่งผลกระทบในเชิงบวกอย่างมีนัย ยะสำคัญต่อการออกพันธบัตรระหว่างประเทศ อย่างไรก็ตาม พบว่า การเติบโตของเศรษฐกิจ (GDP growth) การค้า ระหว่างประเทศ (Trade) และ การใช้จ่ายภาครัฐ (General government final consumption Expenditure) ส่งผลกระทบในเชิงบวกเช่นเดียวกัน แต่ไม่ส่งผลกระทบอย่างมีนัยยะสำคัญต่อการออกพันธบัตรระหว่าง ประเทศ



สาขาวิชา	เศรษฐศาสตร์และการเงินระหว่างประเทศ	ลายมือชื่อนิสิต
ปีการศึกษา	2562	ลายมือชื่อ อ.ที่ปรึกษาหลัก

6085573029 : MAJOR INTERNATIONAL ECONOMICS AND FINANCE

KEYWORD Sovereign Bond, International Sovereign Bond, Global Bond Market,
D: International sovereign bond issuing, Bond issuing, Bond financing

Thanatcha Varaputtanon : The Determinant of International Sovereign
Bond Financing in Developing Countries.. Advisor: Asst. Prof. Dr. YONG
YOON

Governments need to secure finance for their country's public projects. There are various ways for governments to acquire funds, for example, through taxation, borrowing money from international banks, issuing government bonds, and so on. For developing countries, a government may consider issuing international sovereign bonds to meet the country's financial needs. This thesis looks at the determinants of international sovereign bond financing by 36 emerging economies using data collected from the Bloomberg terminal on international sovereign bonds issued between 1996 and 2016. The thesis adopts the discrete choice logit-fixed effect model to empirically verify factors suggested by S&P (2014) that determine international bond issuance. Among five factors, government effectiveness is found to be statistically significant and positively related international bond issuance. Other factors such as GDP growth, Trade, and General government final consumption expenditure, were found to be positively related to international sovereign bond issuance but were not statistically significant.



Field of Study:	International Economics and Finance	Student's Signature
Academic Year:	2019	Advisor's Signature

ACKNOWLEDGEMENTS

Throughout the writing of this thesis I have received a great amount of support and encouragement.

Firstly, I would like to thank my advisor, Assistant Professor Dr. Yong Yoon, whose proficiency was valuable in configuring the research questions and methodology. Your insightful feedback pushed me to sharpen my thoughts and brought my work to a higher-level thesis. Moreover, your encouragement not only push me to complete a better thesis but also to motivate me.

Secondly, I would like to express my appreciation as well as admirable to the committees for their remarkable encouragement and inspiration. Your feedback has refined my work to a better thesis.

In addition, I would like to acknowledge the staff from MAIEF program as well as the staff from faculty of Economics for their admiring assistance and collaboration. I want to thank you for your patient support and for all of the opportunities I was given to further my research.

Lastly, I would like to thank you my family and friends for their consolation and compassion. You are always there for me, not only during the hard time but also being one who support me since the beginning of the studies.

Thank you.

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Thanatcha Varaputtanon

TABLE OF CONTENTS

	Page
ABSTRACT (THAI)	iii
ABSTRACT (ENGLISH).....	iv
ACKNOWLEDGEMENTS	v
TABLE OF CONTENTS.....	vi
LIST OF TABLES	x
LIST OF FIGURES	xi
1. Introduction	1
1.1. Background of the study.....	1
1.2. Objective and Scope	6
1.2.1. Objective.....	6
1.2.2. Scope	7
1.3. Specific Terms and Definitions	10
1.4. Data summary.....	12
1.4.1. Countries that issue international sovereign bond.....	14
1.4.2. Countries with no international sovereign bond issuance	17
1.5. Statement of contribution	20
2. Literature Review	21
2.1. Various ways of financing a country	21
2.1.1. Taxation Method.....	21
2.1.2. Borrowing from the IMF.	25
2.1.3. Other AID or ODAs	27
2.1.4. Multilateral development banks	28
2.2. Factors affecting government bond issuance	30
2.3. Factor determining international sovereign bond issuance	33
2.3.1. Institutional Effectiveness	34

2.3.2.	Economic Structure and Growth	36
2.3.3.	Fiscal Flexibility and Performance.....	37
2.3.4.	Monetary Flexibility	39
2.3.5.	Global Liquidity	40
2.4.	Cost of domestic bond and international bonds issuance	41
3.	Conceptual Framework	46
3.1.	Specific Terms and Definitions	47
3.1.1.	International Sovereign Bond.....	47
3.1.2.	Domestic Sovereign Bond.....	47
3.1.3.	Institutional Effectiveness	48
3.1.4.	Fiscal Flexibility and Performance.....	48
3.1.5.	Economic Structure and Growth	49
3.1.6.	Monetary Flexibility	49
3.1.7.	Global Liquidity	49
3.1.8.	Official Development Assistance (ODA).....	50
3.1.9.	Multilateral development banks	50
3.2.	Institutional Effectiveness	51
3.2.1.	Description.....	51
3.2.2.	Expected Sign	52
3.3.	Economic Structure and Growth	52
3.3.1.	Description.....	52
3.3.2.	Expected Sign	52
3.4.	Global Liquidity	53
3.4.1.	Description.....	53
3.4.2.	Expected Sign	53
3.5.	Fiscal Flexibility and Performance.....	54
3.5.1.	Description.....	54
3.5.2.	Expected Sign	54
3.6.	Monetary Flexibility	54

3.6.1.	Description.....	54
3.6.2.	Expected Sign.....	55
4.	Research methodology	56
4.1.	Statements of Hypotheses.....	57
4.1.1.	Statements of Hypotheses.....	57
4.2.	Research Methodology	58
4.2.1.	Linear Probability Model.....	58
4.2.2.	Logistic regression model.....	59
4.2.3.	Panel data.....	60
4.2.4.	Random Effects	61
4.2.5.	Fixed Effects.....	62
4.2.6.	Panel data-Logit Fixed Effect model.....	63
4.3.	Data Measurement and Sources	69
4.4.	Expected Signs of the Hypotheses and Reason underlying the Signs.....	70
4.5.	Variables and Country Characteristics	71
4.5.1.	Country Characteristics	71
4.5.2.	Summary table of the five main key factors.....	74
5.	Results	76
5.1.	Result from logit-fixed effect Model.....	77
5.2.	Comparison of the results from OLS model, logit-random effect model and logit-fixed effect model	83
5.2.1.	Hausman Test	89
5.3.	Sub-sample analysis between low-income and high-income countries	91
5.3.1.	High-Income country.....	91
5.3.2.	Low-Income country	95
6.	Conclusion.....	99
7.	Appendix	102
8.	References	107
	REFERENCES	114

VITA.....116



จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

LIST OF TABLES

	Page
Table 1 Comparison of domestic and international bonds.....	5
Table 2 Percentage of international sovereign bond Issuance by Countries	12
Table 3 Countries with no international sovereign bond Issuance	13
Table 4 Data measurement and sources.....	69
Table 5 Expected Relationships in the Estimation Model.....	70
Table 6 Comparison between developing countries that issue international sovereign bond issuance and developing countries that do not issue.....	71
Table 7 Country Characteristics in 1996	72
Table 8 Country Characteristics in 2016	73
Table 9 Summary Table of Variables of countries that issue international bond at least once.....	74
Table 10 Summary Table of Variables of countries that never issue international bond.....	74
Table 11 Logit-fixed effect result (1).....	77
Table 12 Logit-fixed effect result (2).....	77
Table 13 Comparison of the results from OLS model, Logit-random effect model and Logit-fixed effect model	83
Table 14 Logit-fixed effect result for high income countries	91
Table 15 Logit-fixed effect result for low-income country	95

LIST OF FIGURES

	Page
Figure 1 International sovereign bond Issuance (Billion USD).....	14
Figure 2 International sovereign bond Issued by Latin America countries (Billion USD)	15
Figure 3 International sovereign bond Issued by ASEAN countries (Billion USD) ...	16
Figure 4 Conceptual framework	46
Figure 5 Panel data.....	60
Figure 6 Hausman test result.....	90
Figure 7 Result for logit-fixed effect regression from Stata.....	102
Figure 8 Result for logit-random effect regression from Stata.....	103
Figure 9 Result for OLS regression from Stata	104
Figure 10 Result of sub-sample analysis on High-income developing countries.....	105
Figure 11 Result of sub-sample analysis on Low-income developing countries.....	106

1. Introduction

1.1. Background of the study

Background

To realize sustained economic growth, governments in developing countries need to continuously improve the physical and social infrastructure through huge public projects as well as subsidize businesses to enhance their country's competitiveness. Such public investments require large amounts of money. Moreover, during crises, governments often face huge budget deficits which limit finances available for investment in major public projects. To meet the financial challenges, some governments may borrow money from financial institutions such as IMF and/or seek assistance and loans from the World Bank and other development banks. Sometimes, a government may choose to issue bonds domestically and/or internationally to raise funds for public projects.

The global financial market including the bond market has grown exponentially in recent years. According to the Bank of International Settlements (2019), the size of the global bond market reached 25,196 billion USD as of the end of 2019. The international sovereign bonds issued by developed countries and developing countries according to the Debt Securities Statistics from the Bank of Settlements (2019) reached 1,242 billion USD of which about half or 630 billion USD were issued by developed countries in 2019. In addition, in comparison to the domestic bond market, developing countries are likely to issue bonds in a foreign market rather than issuing bonds in their local bond market. In this thesis, one of the

primary aims is to better understand why developing countries may choose to issue bonds in the international market dominated by foreign currency as well as determine which factors are related to international sovereign bonds issuance.

According to Asian Development Bank (2002), World Bank (2005) and Grandes and Peter (2013) and others, after the financial crises in the 1990s, many emerging economies experienced a liquidity dry up and capital outflow leading to financial market and even economic collapse. Crisis led to debt defaults which created difficulty in borrowing credit and worsen the ability of countries to pay as there was a continuous capital outflow.

There are various ways for a government can meet the financial requirements of their country. One way is by taxation. A government will collect tax from their citizens and use the revenue to improve their country. An efficient tax system can raise revenue needed to finance a country's expenses. For example, income tax is a crucial part of the fiscal system (Robert C. Brown, 1933), However, there are usually limitations on using taxation alone. One issue can be the limitation of a country's tax base especially for countries with low levels of income. That is, countries with a small tax base may not be able to generate enough income to meet the country's expenses. On top of that, as stated by Boqiang Lin and Zhijie Jia (2019), a government may be unable to increase the tax rate beyond an optimal point as this may lead to decreasing tax revenue (i.e. Laffer curve), which may prove to be detrimental to economic growth. As stated in "Tax Policy Center's Briefing Book through the elements of the US tax system", taxes affect the economy in the long run through the supply side, increasing tax rate can reduce work, savings and investment incentive. Therefore,

taxation may not be an optimal way to finance a country, especially if the country has low levels of income, as a limited tax base will play a major role in taxation method and increasing the tax rate beyond the optimal point will be detrimental.

Apart from taxation, a government can borrow money from financial institutions like the IMF or other development banks. According to the IMF, unlike development banks where a country would borrow money for some specific project like infrastructure development or research and development projects, the IMF provides financial support for balance of payment problems especially when hit by financial crises. The IMF will provide financial support to create breathing room for a country to restore economic stability and growth. However, by borrowing money from the IMF, a country needs to agree on the appropriate policy and will have to work closely with the IMF to ensure responsible spending. The government and the IMF must agree on a program of economic policies and the government has a responsibility to commit certain policy actions conditionally which will be detailed in a “Memorandum of Understanding”. With more conditions and commitments, the borrowing country would lose sovereignty and may choose not to borrow from the IMF. For instance, the IMF would usually ask the borrowing country to reduce government spending to restore current account balance and economic stability which means less spending on infrastructure projects, less fiscal policy easing spending and so on. With these conditions, many countries may feel these as a threat to their economies.

In addition, like receiving funds from IMF, Hagen, Rune Jansen (2009) there can be a moral hazard problem towards multilateral lending as well as Gurara, Daniel,

et al (2020) receiving funds from MDBs is likely to increase borrowing costs and longer maturities of emerging economies and developing countries. Therefore, many countries have chosen to borrow from other resource-borrowing money, from other investors or from other countries by issuing bonds.

Bond issuance is another way to finance countries for many governments. When the government needs money to fund its activities, the government can choose between issuing bonds in their own currency or issuing bonds in other major currencies. Over the past decade, domestic and international sovereign bonds have been issued by the government globally. Issuing bonds in their own currency may not be a distinct choice to finance a country especially if a country has been experiencing financial problems or an economic downturn, or people in that country have lower levels of income. Therefore, many countries, especially developing countries may choose to issue bonds in the International bond market instead.

Although domestic bonds issued by developed countries is more viable as their people have higher levels of income to invest in financial markets, for developing countries that have lower levels of income and therefore lower saving and investment, issuing international bonds to raise funds from investors from other countries may be a better alternative to secure much needed finance. According to Clearing Settlement and Custody (Second Edition) David Loader (2014), domestic bonds are issued by local borrowers of the local market in local currency while International bonds are issued by foreign borrowers of the international euro-markets in any foreign currency.

Unlike domestic bonds which have been issued in a country's currency, international sovereign bonds can be said to be bonds issued by a government not in terms of its currency but international major currencies such as the US dollar or Japanese Yen – developed country. For example, international sovereign bonds issued by Thai government will be in US dollars rather than Thai baht.

	Domestic Bonds	International Bonds
Issued by	Local Borrowers	Foreign Borrowers
Domicile of issue	Local Markets	International Euro-markets
Dominated in	Local Currency	Any foreign Currency
Regulated by	Securities laws of local country	Not subject to the laws of any particular country

Table 1 Comparison of domestic and international bonds

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

This of course raises many interesting questions like which type of government bonds should be sold as such decisions depend on creditworthiness and other factors such as government effectiveness, economic growth, government consumption expenditure, trade, and broad money growth, and so on. This thesis looks at which factors determine international sovereign bond issuance of developing countries after reviewing the advantages and disadvantages of other methods a country can pursue in order to secure finance for the country's projects.

1.2. Objective and Scope

1.2.1. Objective

1. Which factors affect international sovereign bond issuance of the country?

After Financial crisis or when a country has run a budget deficit, the government will search for ways to finance its country. There are various ways to finance a country. One is increasing collectable tax which depends on how large the tax base is as well as increasing tax will decrease household spending resulting in a slowdown in the economy. Another channel is to borrow money from the IMF. However, borrowing money from the IMF tends to require more responsibility from the government as well as people in the country. Before lending money to a country, a country needs to agree on a specific program with the IMF which will bound a country to follow the program strictly resulting in a country losing control in some part of government budgeting. A country may not be able to have a government budget deficit to boost the economy. On the other hand, there is a way to borrow money without losing control of a government budget, issuing bonds.

The government can issue bonds domestically and internationally. Domestic bonds are the most favorable way for countries to finance themselves. Domestic bonds will be issued in local currency. On the other hand, as domestic bonds are issued in local currency and sold to people living in that country, if a country has a lower level of income or has been faced with financial crisis or problems, how can issuing domestic bonds be able to be successful and help financing a country?

Therefore, when a government needs to finance a country, a government may issue bonds internationally. As international sovereign bonds are bond issuing in another currency, foreign investors can buy them easily which can attract more investors. When there are more investors investing in international sovereign bonds issued by a country, a country can use those capitals to pay foreign debt, invest in infrastructures and enhance welfare in order to increase people's basic living.

Hence, this thesis will review the pattern of international sovereign bond issuance across developing countries in ASEAN, Eastern Europe, Latin America and Sub-Saharan Africa region.

1.2.2. Scope

This research will study the determinant of international bond financing in emerging economies. The data set is international sovereign bonds which were issued between 1996 - 2016.

According to S&P Global Ratings (2014), these are factors affecting the amount and whether or not countries will issue bonds. There are four main internal factors and one external factor that have an impact on the countries' bond issuance - Institutional Effectiveness, Fiscal Flexibility and Performance, Economic Structure and Growth, Monetary Flexibility and Global Liquidity.

This study aims to examine how five main key factors, which are institutional effectiveness, economic structure and growth, fiscal flexibility, monetary flexibility and global liquidity, affect the probability of a country to issue government bonds.

This research has applied panel data-logit fixed effect model as by applying the panel data-logit fixed effect model, the endogeneity problem can be eliminated. In the fixed effect model, the control variables where control variables are immeasurable will not be captured as each variable will cancel each other out. Fixed effects explain the relationship between independent and dependent variables within an entity. Fixed effects have been applied when an individual is assumed to influence other variables.

Scope of the study

Time: 1996-2016 (21 years)

Data: developing countries in ASEAN, Eastern Europe, Latin America and Sub-Saharan Africa which have issued international sovereign bonds during 1996-2016 (**ASEAN:** Indonesia, Philippines, Thailand, and Vietnam, **Eastern Europe:** Bosnia, Croatia, Cyprus, Montenegro, Serbia, and Ukraine, **Latin America:** Argentina, Belize, Brazil, Chile, Columbia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, and Venezuela, **Sub-Saharan Africa:** Congo Rep., Côte d'Ivoire, Gabon, Kenya, Namibia, Nigeria, Senegal, South Africa, and Zambia)

This research has acquired the data of international sovereign bonds issued by selected developing countries from Bloomberg terminal. The main four variables - economic structure and growth, global liquidity, fiscal flexibility and performance and monetary flexibility are obtained from World Bank's Worldwide Development Indicators (WDI) while another variable - institutional effectiveness are obtained from World Bank's Worldwide Governance Indicators (WGI).

Choice of country

This thesis has studied the determinant of international sovereign bond of developing countries in ASEAN, Eastern Europe, Latin America and Sub-Saharan Africa as these regions account for most of the international bond issuers in global bond market. In addition, these regions are considered to be emerging economies where there are not many options for them to acquire more incomes. As developing countries in ASEAN, Eastern Europe, Latin America and Sub-Saharan Africa are mostly low-income and middle-income countries, they cannot increase their tax rate as high as they want as well as their domestic bond may not be the best option for them. For developing countries that have lower levels of income and therefore lower saving and investment, issuing international bonds to raise funds from investors from other countries may be a better alternative to secure much needed finance.

1.3. Specific Terms and Definitions

International Sovereign Bond - international bonds which are issued by the government in other major currencies such as US dollar or Japanese Yen. The main investors are in the global bond market.

Domestic Sovereign Bond - domestic bonds issued by the local government in local currency and regulated by the local authorities. The main investors are in the local bond market.

Institutional Effectiveness - the perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation as well as the credibility of the government's commitment to such policies.

Fiscal Flexibility and Performance - all government current expenditures for purchases of goods and services (including compensation of employees)

Economic Structure and Growth - income levels, growth prospects and economic diversity and volatility. The following factors can enhance a country's economic growth and income level.

Monetary Flexibility - the country's monetary authority can fulfill its mandate while supporting sustainable economic growth and recovering from economic or financial crises.

Global Liquidity - a country's ability to obtain funds from abroad to meet its public and private sector. It can refer to the transactions and positions of people in the country, the flow, the stocks and trade.

Official Development Assistance (ODAs) - a government aid that promotes the development of the economies and welfare of developing countries.

Multilateral development banks (MDBs) - international institutions that provide financial assistance in the form of loans and grants to developing countries for investment projects and policy-based loans in order to promote economic and social development.

Least Developed Countries (LDCs) - low-income countries confronting severe structural impediments to sustainable development.

1.4. Data summary

The data collected from Bloomberg has shown that there are 36 countries that issue international sovereign bonds in ASEAN, Eastern Europe, Latin America, and Sub-Saharan Africa.

Eastern Europe	10.18%	Latin America	52.28%
Bosnia	0.03%	Argentina	0.19%
Croatia	2.54%	Belize	0.17%
Cyprus	0.76%	Brazil	6.12%
Montenegro	0.33%	Chile	4.72%
Serbia	1.46%	Colombia	8.53%
Ukraine	5.05%	Costa Rica	2.30%
Sub-Saharan Africa	7.89%	Ecuador	3.05%
Congo, Rep.	0.13%	El Salvador	1.50%
Côte d'Ivoire	1.61%	Guatemala	0.64%
Gabon	0.58%	Honduras	0.26%
Ghana	0.98%	Mexico	9.74%
Kenya	0.72%	Nicaragua	0.00%
Namibia	0.37%	Panama	1.72%
Nigeria	0.39%	Paraguay	0.63%
Senegal	0.26%	Peru	7.95%
South Africa	2.06%	Venezuela	4.78%
Zambia	0.79%		
ASEAN		29.64%	
Indonesia	11.21%	Thailand	12.58%
Philippines	4.12%	Vietnam	1.73%
Grand Total		100.00%	

Table 2 Percentage of international sovereign bond Issuance by Countries

ASEAN	Latin America
Brunei Darussalam	Uruguay
Cambodia	Bolivia
Laos	French Guiana
Malaysia	Guyana
Myanmar	Suriname
Singapore	
Sub-Saharan Africa	
Angola	Madagascar
Benin	Malawi
Botswana	Mali
Burkina Faso	Mauritania
Burundi	Mauritius
Cameroon	Mozambique
Cape Verde	Niger
Central African Republic	Réunion
Chad	Rwanda
Comoros	Sao Tome
Djibouti	Seychelles
Equatorial Guinea	Sierra Leone
Eritrea	Somalia
Ethiopia	Sudan
The Gambia	Swaziland
Guinea	Tanzania
Guinea-Bissau	Togo
Lesotho	Uganda
Liberia	Western Sahara
	Zimbabwe

Table 3 Countries with no international sovereign bond Issuance

1.4.1. Countries that issue international sovereign bond

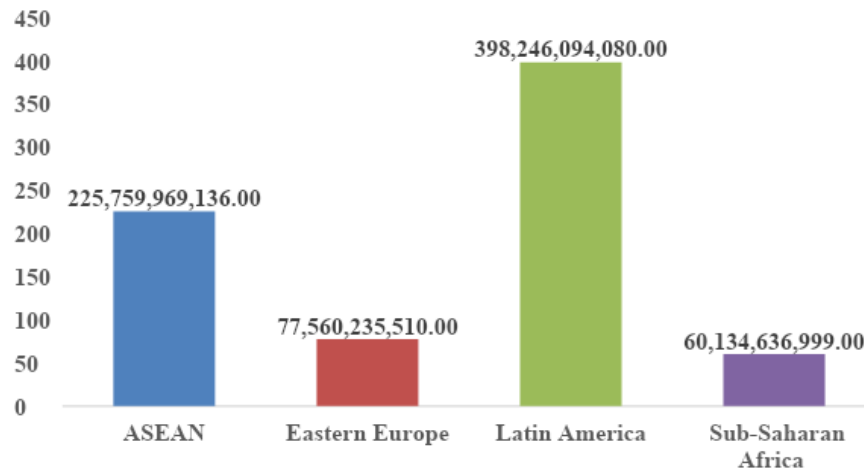


Figure 1 International sovereign bond Issuance (Billion USD)

From the chart above, we can see that Latin America is a region that issued the most international sovereign bond; followed by ASEAN, Eastern Europe and Sub-Saharan respectively. Latin America region has issued international sovereign bond 398.25 billion USD while ASEAN which has been ranked as the second place has issued 225.76 billion USD. Eastern Europe and Sub-Saharan Africa have issued international sovereign bonds 77.56 billion USD and 60.13 billion USD respectively.

Nevertheless, from the table below, when we look deeply into the data, we have found that out of 36 developing countries that issue international sovereign bonds the most is Thailand, ASEAN region, which can account for 12.58% of total. While Indonesia comes in second place with 11.21%, Mexico comes in third place with 11.17% of total in issuing international sovereign bonds.

Latin America

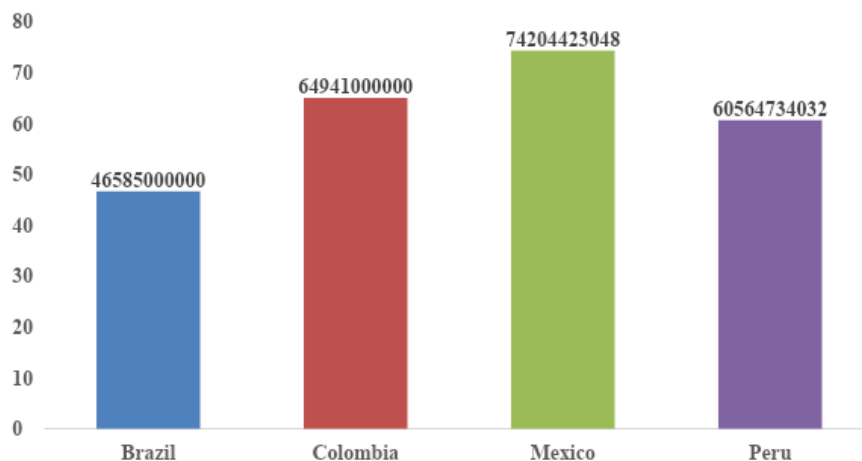


Figure 2 International sovereign bond Issued by Latin America countries (Billion USD)

Latin America is the region that issues international sovereign bond the most. According to the Capital Flows to Latin America and the Caribbean report, released by the Washington Office of the Economic Commission for Latin America and the Caribbean (ECLAC), the strong international bond market performance of Latin America was supported by a tightening in bond spreads which attracts more investor searching for higher yield bonds as well as the improving economic condition of Latin America nations.

ASEAN

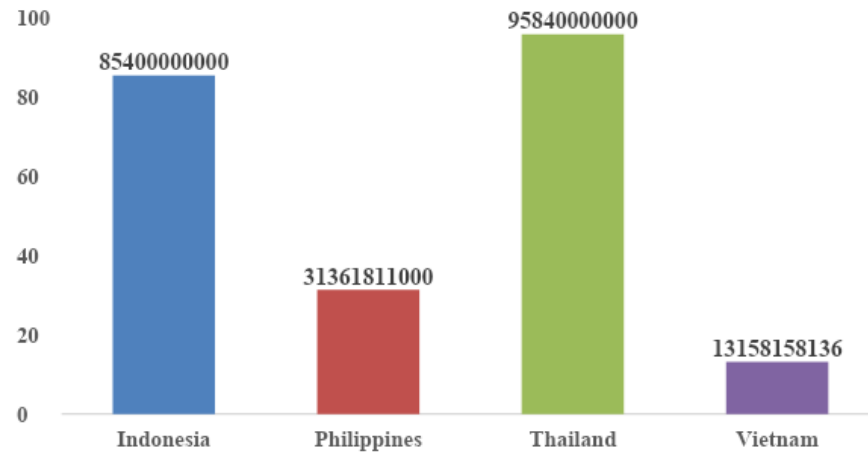


Figure 3 International sovereign bond Issued by ASEAN countries (Billion USD)

Looking at ASEAN countries that issue international sovereign bond, we can see that the 4 countries that represent ASEAN are the countries having the most population. According to ASEAN Member States, Indonesia has the most population in the region followed by Philippines, Vietnam and Thailand respectively. Among all the ASEAN nations, the population is over 622 million people. The region has one of the largest economies and is expected to be in the 4th ranking largest economy in the World by 2050. It also has one of the largest labor forces in the world, falling only behind India and China.

Sub-Saharan Africa

According to 2016 edition of the International Debt Statistics (IDS) from World Bank, the data have shown that there was a gradual increase in international sovereign bond in some Sub-Saharan countries, especially those who benefited from

Heavily Indebted Poor Countries (HIPC) and Multilateral Debt Relief Initiative (MDRI) debt relief programs. Steady global market conditions and the potential for higher returns for investors have helped pave the way for more access to international markets, where the average return for these bond issuances is about 6.6%, with an average maturity of 10 years.

1.4.2. Countries with no international sovereign bond issuance

ASEAN

According to the data which have been obtained from Bloomberg terminal, we can see that Malaysia is one of the countries in ASEAN that has not issued bonds between 1996-2016 periods even though Malaysia economy is growing at a faster pace. The reason is that when the Government issues international sovereign bonds, it means that the government is borrowing money from other countries – becoming a borrower. However, for Malaysia, the Malaysian government does not want to rely much on others. As stated by Malaysian Prime Minister Mahathir Mohamad to ABS-CBN news channel (Nikkei Asian Review, March 7, 2019), “when the person is a borrower, he is under the control of the lender and can fall into a debt trap.” Malaysian government does not want to be controlled by other countries and also wants to limit others’ influences in the country.

Like Malaysia, Laos, Myanmar, and Cambodia are the socialist countries which tend to be aware of capitalist influences. By issuing international sovereign bonds, these countries need to rely more on other countries’ money, especially money

from the capitalist. During 1996-2016, globalization was not growing as much as it is today – not much foreign investment, infrastructure investment or the collaboration from abroad. Laos, Myanmar and Cambodia did not open much of their countries to others as well as borrow money from others by issuing international bonds.

On the other hand, Singapore, which is a politically and economically stable country, does not issue international bonds even though the risk of its government defaulting is very low with the country's AAA country rating – the highest country rating. As stated in the Monetary of Singapore Guide, the Singapore Government has consistent budget surpluses over the years with a good manner of fiscal policy; the country does not need to borrow to finance its expenditure.

Latin America

According to the Economist Intelligence Unit, in 2016, capital inflows to the emerging markets have resumed reflecting in rallies across the emerging market asset classes and Latin America is one of the most attractive regions. However, compared with other big countries like Brazil, Mexico and Argentina, the small economy countries tend to have a very weak market in international sovereign bonds amid slow economic growth and political turmoil across the World. As in the 1980s, Latin America has faced a debt crisis leading the region into recession, many countries have been in poverty and economic collapse. Many Latin American countries, especially the small economies, need to seek help from the IMF and reform their economies. Moreover, with the economic reformation and the lender asking for pay back, those countries have very weak economic indicators and are considered to have an exceptionally low credit rating. With the reasons mentioned earlier, there was no

demand for those countries' international sovereign bonds as the investors were concerned about the government defaulting problem.

Sub-Saharan Africa

Even though government bonds are a popular source of financing for many sub-Saharan African countries. One reason for this is that sovereign bonds have fewer conditions attached to them than the loans available from traditional sources such as the International Monetary Fund (IMF) (Tyson, 2015), many countries in Sub-Saharan Africa were still unable to issue international sovereign bonds. As borrowing money from others, especially issuing international sovereign bonds, required specific qualifications like economic structure and growth, fiscal flexibility, monetary flexibility, global liquidity and institutional effectiveness (S&P Global Ratings), and some countries cannot meet the qualification as they have a lower level of economic structure and growth, fiscal flexibility, monetary flexibility, global liquidity and institutional effectiveness, thus, those countries have earned poor ratings. When a country has low rating or non-investment grade country rating, the likelihood of issuing international sovereign bonds tend to be low as there is no demand for the bonds and a concern of government defaulting. In contrast, some countries do not issue international sovereign bonds even though they have good credit ratings because they have consistent income from exporting diamonds and other minerals.

1.5. Statement of contribution

In this thesis, the result has shown that there are five main key factors to determine international sovereign bond issuance for developing countries. The first contribution of this thesis is to illustrate which factor has significantly affected the decision of developing countries on issuing international sovereign bond. The model formulated in this thesis greatly impose prevention on endogeneity problem. Model used in this research typically will not capture the control variables where control variables are unmeasurable and similar overtime. However, the main challenge in realizing the above contribution is that apart from the five main key factors, there are other country characteristics that may affect the decision on issuing international sovereign bond of developing countries.

Accordingly, the finding of this research will resound to the benefit of the government of developing countries considering that there are five main key factors which play an important role in determinants of international sovereign bond issuance. To acquire more funds, the government should consider improving these factors in order to attract more foreign investors. As foreign investors are likely to invest in an international bond with less default risk in comparison to bond that may have a higher chance of default risk. Therefore, this thesis will provide another perspective for the government on which area should be improved and concentrated to pursue a better policy and better environment for investors.

2. Literature Review

In this section, we will discuss the determinant of international sovereign bond issuance of developing countries. This section has been divided into four sub-section. First, we will discuss the advantages and disadvantages of other sources of income which can be acquired by the government - taxation method, borrowing from the IMF, receiving funds from other AID/ODA and multilateral development banks. Second, we will discuss factors which affect government bond issuance of a country. Third, we will discuss further on factors determining international sovereign bond issuance of developing countries. Lastly, we will discuss what are the differences between the cost of domestic sovereign bond and international sovereign bond issuance.

2.1. Various ways of financing a country

2.1.1. Taxation Method

The relationship between rates of taxation and the economy can be explained by the Laffer curve. As illustrated by Boqiang Lin and Zhijie Jia (2019), the relationship between tax rate and economic growth in China applying static and dynamic CGE models is comparable to the relationship between tax rate and the employment rate. The paper has used China Input-Output Table of China (CIOT) to construct the Social Accounting Matrix (SAM) and the results can be explained that the higher tax rate can be able to decrease household spending, strongly decrease the price of capital goods but progressively increasing the price of labor. When tax rates

increase, households will spend less reducing the demand of commodities resulting in the decline of output from the company. Not only the output from manufacturing decreases but the output from the service sector also decreases as tax rate rises. Moreover, the results also show that the top of China's Laffer curve is 40% approximately. By conducting numerous sensitivity analyses, the results have shown that the government tax peak is about 5-10% earlier than the top of the Laffer curve. So, if the government has reached the peak of the Laffer curve, which depends on a country, increasing more tax may not be able to generate more income to the government but reducing the government revenue instead. Therefore, the recommendation from this paper is to reduce tax rates to be able to increase economic growth and the government revenue.

Peter N. Ireland (1993) has illustrated the effects of a deficit-financed tax cut to economic growth using a simple convex model of endogenous growth. The results have shown that a durable reduction in tax rate can provide a higher government budget in the short term but the expansionary effects of lower tax rates can be able to generate more government revenue in the long term if the government balances its budget gradually. In other words, the paper has shown that a durable reduction in tax rates can help boost real economic growth and long-run government budget balance. Moreover, the government can pay off the debt in the long run without the increasing tax rates but with the strong deficit-financed tax cut.

Fei Lan and Qingzi Cao (2019) have stated that the reduction in tax rate can increase the companies' R&D resulting in more output and the growth in the economy. The paper has illustrated the effect of the reduction in tax rate on

companies' R&D intensity using a natural experiment by China's business tax changing to value-added tax (BT to VAT) to identify the relationship between the reduction in tax rate and the economy. The result has shown that the tax reform from BT to VAT which reduces the tax rate of companies is able to encourage companies to increase the level of R&D which can generate more positive effects to the economy.

Tax systems can have an impact on economic growth as stated by Se-Jik Kim (1998) has shown that the actual growth rate of the US and a fast-growing economy in East Asian are varied by the different tax systems. The paper has used the calibrated model to assess the role of differences in taxes and other variables. There are three main findings. One is that the difference in growth rate can be described by the difference in tax systems among the countries. Second, the difference in the preferences describes around 4%. Lastly, the differences in economic growth across countries can be explained by labor income tax, debt-to-equity ratio and inflation.

Fiaschi (1999) has found that public investment is driven by labor income tax rate and capital income tax rate in an economy where majority voting can determine fiscal policy and individuals can obtain different initial endowments. The paper has applied an endogenous fiscal policy model and stated that the increasing tax rate on labor income has a positive effect on economic growth but provides a negative effect on income inequality. However, the increasing tax rate on capital provides opposite results. The increasing tax rate on capital effects negatively on economic growth but effects positively in income inequality.

Zeyneloglu (2018) has illustrated the effect of the expansionary fiscal policy on economic growth using a dynamic stochastic general equilibrium (DSGE). The paper has set up a model by applying a closed economy with rational expectation household living indefinitely as well as a monopoly competitive market. The households have been divided into two types, households with access to the financial market - asset-holders and households who consume all the disposable income and hold no financial assets - non asset-holders. Firms in the model have been applied to monopolistic competition assuming that each good is an imperfect substitute. In this model also applied a lump sum tax collected and a one-period real bond issued by the fiscal authority. In contrast to the endogenous growth model, the paper has assumed that the monetary authority has set the nominal interest rate by applying a Taylor rule. The empirical result of the paper has shown that the expansionary fiscal policy under the golden rule generates a higher rise in output. The expansionary fiscal policy is when a government reduces the tax rate to allow households or firms to have more spending. Therefore, in the other words, increasing the tax rate can lead to the opposite direction of the reduction in tax rate which is a slowdown in the economy.

Muinel-Gallo and Roca-Sagales (2013) has analyzed the relationship between income inequality and economic growth through fiscal policy using structural equations with error components through the fiscal policy outcome. The paper uses unbalanced panel data of 21 high-income OECD countries during the period of 1972-2006. The result has indicated that an increase in expenditures and higher direct tax rate have provided a crucial decrease in GDP growth. Moreover, the result also proposed that the optimal fiscal policy is to reduce tax rates in order to increase the economic growth as well as reduce income inequality.

From all the literature reviews in taxation method: the ways to finance a country, we can see that the expansionary fiscal policy - the reduction in tax rate can generate more positive effect to the economy than the contractionary fiscal policy - an increase in tax rate. In other words, it can be indicated that increasing the tax rate may not help financing a country but slowdown the economy. Therefore, if a country seeks money to finance a country, finance specific projects as well as increase economic growth, increasing the tax rate is not a reasonable way for policymakers to propose for a country. Taxation method is not a promising way to finance a country.

2.1.2. Borrowing from the IMF.

Marchesi and Sabani (2007) have illustrated the concern of IMF for reputation on conditional lending applying a dynamic panel using the data set of 53 middle income countries during the period of 1982-2001. The paper has found that because the IMF has played the dual role between a creditor and an economic monitor, the IMF may conduct bias for lending funds to some countries. As the IMF wants to pursue its reputation as a good monitor, the IMF intends to provide financial support to countries where the organization can maintain its reputation. Moreover, the relationship between the IMF and a country also determines the conditional lending of the IMF. As the IMF disbursement will increase when there is a longer relationship between the IMF and that country.

Markus Jorra (2012) has applied a pooled probit model using the panel of 57 developing and emerging countries during the period of 1975 - 2008 to conduct the medium and long run effect of IMF programs on sovereign risks. The results have

shown that the IMF programs significantly increases the likelihood of sovereign defaults of a country in the medium term by about 1.5 to 2 percentage points after receiving funds from the IMF program. Furthermore, the paper has also illustrated that the IMF programs are harmful to fiscal solvency as the lending programs are provided to countries with weak economies. Also, the results have aligned with the hypothesis that moral hazard can be happening by the borrowers in these circumstances.

Graham Bird (1993) has examined numerous empirical evidences on the effect of the IMF lending applying General Resources Account (GRA) and other special factors for low income countries as well as investigating the size and pattern of the lending during the period of 1982-1991. The results have shown that borrowing from the IMF does not have a significant impact on improving financing balance of payment deficits in developing countries both in terms of size of the financial needs and other financial flows. For instance, while the IMF has provided lending for Latin America countries and the Eastern European countries, these countries have experienced more severe economic difficulties by using the funds from the IMF. The empirical evidence has also supported that while the funds are needed to be assisted by members, the IMF can influence the demand of members by the interest rates charged from in-need countries which can lead to moral hazard arguments.

From the literature reviews above, we can see that borrowing from other financial organizations like the IMF can generate both positive and negative effects on improving developing countries' defaults. However, borrowing money from the IMF does not mean that a country's financial crisis is solved. A country who joins the IMF

lending program tends to have weak economic fundamentals, so lending money to them does not solve the roots of the problems but sometimes increases a chance a country can get into more economic slowdown. Moreover, the empirical results also suggest that there is a moral hazard while IMF lending money. The IMF tends to establish a biased decision both country decisions as well as money charged from countries who borrow money from the organization.

2.1.3. Other AID or ODAs

Guillon and Mothonnat (2020) have analyzed the determinants of Chinese ODA allocation African countries by using OECD data of three ODA broad sectors - the Social Infrastructure and Services sector, the Economic Infrastructure and services sectors and the Production sector. They have used Aid Data's Global Chinese Official Finance Dataset in the period of 200-2004 to determine Chinese ODA using maximum-likelihood regression as the main specification and Tobit regression as a confirmation for robustness. The data has shown that China has provided 971 Social Infrastructure and Services sector projects, 218 Economic Infrastructure and Services sector projects and 138 Production sector projects to African countries. The paper illustrated that China has been likely to allocate ODA to weaker institutional African countries. Also, China's overall ODA to African countries can be misleading by China's interests instead of African countries' interest as well as the project have been depending on China's satisfaction.

Momita, Matsumoto and Otsuka (2019) have used a panel dataset of 117 countries during 1980-2010 to analyze whether the ODA from Japan has contributed

to economic growth in partner countries or not. The paper has applied two estimation methods on the panel dataset. The paper has applied the recipient country level fixed-effects estimation with the inclusion of the interaction terms of the time and region dummies and other covariates and employed the Generalized Method of Moments (GMM) estimation. In the GMM estimations, many variables including levels and/or differences of the past values of the lagged dependent and other exogenous regressors are used as the instruments for the lagged dependent variable and the ODA variables. The result has shown that the Japanese ODA has positively affected industrial growth more than it has contributed to economic growth.

Biswajit Maitra (2019) has used the post-independence period data to illustrate the impact of financial aid on income, price level and interest rate in Sri Lanka. The paper has conducted the Error Correction Model (ECM) based on the cointegrating relations estimated by Johansen cointegration test. The result has shown that the foreign aid has negatively affected both income and price level as well as increased the interest rate both in the short-run and the long-run. Therefore, the paper has suggested that Sri Lanka should reduce its reliance on foreign aid as the foreign aid tends to not help growing its economy.

2.1.4. Multilateral development banks

Gurara, Daniel, et al (2020) have illustrated the role of multilateral development banks (MDBs) on the terms of syndicated loans. The paper has applied the OLS estimation model and the result has shown that the participation of multilateral development banks is likely to increase borrowing costs and longer

maturities of emerging economies and developing countries. Moreover, the paper has also indicated that multilateral development banks tend to provide lending to borrowers from countries with high credit and financial risk.

Nemlioglu, Ilayda, and Sushanta Mallick (2020) have investigated the effect of multilateral lending on accumulating capital of countries with a higher level of innovation. The paper has examined the role of the World Bank as well as IMF financing on capital stock using data from 175 countries between 1970-2017. The paper has applied Fixed-Effect model and Dynamic-System GMM estimations and the result has shown that long-term lending from MDBs has a positive effect on domestic capital for G-7 countries. However, for non-G7 countries, even with a higher level of innovation, they are not likely to gain advantages from lending in increasing their capital stock, as the institutional effectiveness is different among those countries. In addition, multilateral development banks lending only benefits a borrowing country when a country has a higher level of intellectual capital.

Hagen, Rune Jansen (2009) has analyzed the role of multilateral financial institutions on private lenders in the sovereign bond market assuming that they have an informational advantage. The results in this paper are based on a stylized model that might be extended in many directions, some of which could change the relative merits of certification and lending. The paper has found that there can be a moral hazard problem towards multilateral lending which the creditworthiness of borrowers is decreased as private lenders seek to avoid ex post default by constraining credit.

In conclusion, from the literature reviews mentioned above, foreign aid or the ODA - Official Development Assistant may not help financing the economy of a

partner country but damaging some parts of the economy. Moreover, the foreign aid sometimes is misleading as the foreign aid comes from the interest of the donor countries, not the need from developing countries.

In addition, even though multilateral development banks are likely to provide lending to countries with financial risks, borrowing from multilateral development banks is likely to increase the borrowing cost of those countries.

2.2. Factors affecting government bond issuance

Many countries have borrowed in international capital markets by issuing sovereign bonds. David A. Grigorian (2003) has used a simple macro model to find the impact of internal and external factors on sovereign issuance. The size of sovereign bond issuance is affected by GDP per capita, high consumer price inflation and changes in term-of-trade. However, there is no linkage between trade openness and fund programs. Like in Presbitero, Ghura, Adedeji (2016) found that the issuance of sovereign bonds is increased when the country has higher per capita GDP, a lower public debt and more effective government. Also, there are global factors that affect the issuance when a country is more likely during periods of global liquidity, high commodity prices and higher market volatility.

Claessens et. al (2003) have applied a panel feasible generalized least squared (FGLS) estimations and illustrated that the government bond market can be affected by institutional and macroeconomic factors. There are several factors that are related with bond markets. Not only economic size but also the economies with broad

financial systems, which can be measured by bank deposits and stock market capitalization, will likely issue more sovereign bonds rather than foreign currency bonds. However, foreign investor demand is certainly associated with size and amount of foreign currency bonds.

Chamon and Hausmann (2005) have applied a log-linear model and found that a small number of institutional and macroeconomic factors explain the ability of countries to issue domestic currency. Eichengreen, Hausmann, and Panizza (2002) have applied the standard t test and specifically found that only country size matters for explaining their measures of “international original sin,” i.e. the currency composition of government debt issued in foreign markets. Though they also find that some institutional factors affect the ability of governments to issue domestic currency denominated debt in the local market.

Claessens et. al (2003) have applied a panel feasible generalized least squared (FGLS) estimations and found that economies that are bigger and have greater domestic investor bases, as proxied by the size of their financial systems, have relatively larger domestic bond markets and issue relatively less foreign currency debt. On the contrary, foreign investor demand (measured alternatively by the government bonds and notes held by non-residents over GDP, holdings of a country’s long-term debt securities by U.S. investors, and total debt securities held by foreign investors) is positively associated with foreign currency bond issuance, both as a share of GDP and total government bonds outstanding.

In another paper, Burger and Warnock (2004) conduct a study of how foreign investors participate in private and public domestic currency bond markets. They find

that some institutional factors, specifically more creditor-friendly policies and laws, help in the development of domestic currency markets. In their study, they also analyze whether domestic currency bonds are attractive to the U.S. investors and estimate CAPM model to see how much U.S. investors value diversifiable idiosyncratic risk

Burger and Warnock (2006) have applied Tobit regression and cross-sectional regression to analyze the development of 49 local bond markets. The main finding is that policies and laws matter: countries with stable inflation rates and strong creditor rights have more developed local bond markets and rely less on foreign currency-denominated bonds. The results suggest that “original sin” is a misnomer. Emerging economies are not inherently dependent on foreign currency debt. Rather, by improving policy performance and strengthening institutions, they may develop local currency bond markets, reduce their currency mismatch, and lessen the likelihood of future crises.

Grigorian, D. A (2003) has applied standard maximum likelihood-based procedures to examine the likelihood of issuing government bonds by emerging economies. The difference between the first and subsequent issues is the benchmark. The subsequent issuers already have an existing benchmark which informs market participants about the spreads that each country will be likely to issue bonds. However, for the first-time issuers, which means there will be limited information available on the country’s worthiness and that will affect how the market reacts to the country’s bond issuance. Moreover, by focusing on the first-time issuers, both international interest rate and US GDP growth rate, which were indicated as external

factors, have significantly affected the likelihood of bond issuance of a country. Internal factors which are the country's GDP, current account level, fiscal balance, foreign reserve/imports, GDP per capita and inflation also have significant impact on bond issuance of a country. However, real GDP growth and exports do not have a significant impact on the probability of bond issuing of a country.

To sum up, to issue Domestic Government Bonds, a country is more likely to have a higher GDP per capita, lower public debt, strong institutional effectiveness - effective government, high quality of public services, strong creditor rights, and broad financial systems.

For international sovereign bonds, a country is more likely to have more creditor-friendly policies and laws, and higher current account level. Talking about external factors, the likelihood of a country to issue international sovereign bonds will increase when there is higher global liquidity - higher current account.

2.3. Factor determining international sovereign bond issuance

According to S&P Global Ratings (2014), these are factors affecting the amount and whether or not countries will issue bonds. There are four main internal factors and one external factor that have an impact on the countries' bond issuance - Institutional Effectiveness, Fiscal Flexibility and Performance, Economic Structure and Growth, Monetary Flexibility and Global Liquidity.

Black and Munro (2010) have applied a discrete choice (probit) model to demonstrate a variety of motivation for international bond issuance for five Asia-

Pacific countries (Australia, Hong Kong, Japan, Korea and Singapore). The result suggested that deviations from covered interest parity are actively arbitrated by both minor currency country residents, as well as by internationally active borrowers among major currencies and issuers are likely to benefit from the liquidity and diversification of larger complete international markets.

2.3.1. Institutional Effectiveness

The first internal factor, institutional effectiveness can be described as government effectiveness or in other word, according to World Bank, the perceptions of the quality of public services, the quality of the civil service and the degree of its, the independence from political pressures, the quality of policy formulation and implementation as well as the credibility of the government's commitment to such policies.

Hsien-Yi Chen and Sheng-Syn Chen (2018) have applied OLS regression as a baseline regression and a two-stage least squares (2SLS) in order to examine the effect of government institutions effectiveness on the likelihood of government credit default by collecting the spreads on five-year Sovereign Credit Default Swaps (SCDS) of 64 countries during the period of January 2003 through December 2014. They have also applied a comprehensive index of the quality of country governance from the World Bank's Governance Index (WGI) to measure the quality of government institutions. The result has shown that the government effectiveness has affected sovereign credit default swap spreads in terms of economic and statistical significance. The paper has also implied that a better quality of government institution

has encouraged a country to pay back debt rather than a country with a lower quality of government effectiveness. Therefore, it can be concluded that a more effective government institution will reduce the likelihood of sovereign default.

Acemoglu and Johnson (2005) have applied OLS regression and two-stage least squares (2SLS) to illustrate the importance of property rights institutions on economic growth, investment and financial development. They have found that the property rights institutions have a significant effect on long-run economic growth, investment and financial development which can also affect the credit default and sovereign bonds in the financial markets.

R. Gaston Gelos, Ratna Sahay, Guido Sandleris (2011) have illustrated the ability of developing countries' governments to access the international financial markets by applying a panel data on a dataset on sovereign bonds issuance and public syndicated bank loans between 1980 and 2000. The result has explained that a better quality of government and institutional effectiveness increases the likelihood of market access substantially.

Jeaneret (2018) has applied log-linear specification to examine the relationship between the level of governance and sovereign credit spread using a dataset of 74 countries over the 1002-2016 period. The paper has applied a structural model in which the government adjusts default and debt policies based on the ability of governments to collect incomes. The result has shown that sovereign credit default swap (CDS) spreads reduce when government effectiveness decreases. The paper has also illustrated that a higher government effectiveness tends to decrease the likelihood of default.

Therefore, we can see that Government regulations are one of the main factors determining the likelihood of issuing domestic or international bonds by creating the costs of funding in different markets. The currency coverage of the guarantee is likely to determine the decision on issuing bonds in the domestic market or international markets.

2.3.2. Economic Structure and Growth

The second factor, economic structure and growth can be proxied by GDP growth (% of GDP) which is a measure of how fast the total output of the country is growing.

Mendoza, E.G., Yue and V.Z. (2012) have applied a General Equilibrium Model of Sovereign Default and Business Cycles to find the relationship between the income fluctuations on sovereign default. They have found that although default is an optional decision for firms and governments, default also triggers a significant loss of the inputs. Moreover, they have also suggested that a country tends to have higher payback when it has a higher income which reduces default.

Arellano Cristina (2008) have developed a small open economy model to determine the relationship between default risks and economic growth of a country. The paper has illustrated that the likelihood of a country to default increases when a country is in a recession or when a country develops a low level of income as a country is likely to not repay the debt. Moreover, the model has shown that a country with higher interest rate fluctuation, higher volatility of consumption relative to

economic growth will tend to develop credit default risks. The model also matched business cycles in Argentina which had a default.

Andreasen, E., G. Sandleris, and A. Van der Ghote. (2019) have illustrated the effect of income distribution and the tax system on sovereign decision and default. They have applied a standard DSGE model to conduct a sovereign default model with a dataset of economic factors of Argentina between the first quarter of 1980 and the second quarter of 2001. They have also considered that the government is the only agent within the small economy that has access to international financial markets. The result has shown that income inequality and regressive tax systems increase the likelihood of a country to default. Moreover, the paper has also illustrated that the probability of default increases when there is an inequality in income distribution.

R. Gaston Gelos, Ratna Sahay, Guido Sandleris (2011) have illustrated the ability of developing countries' governments to access the international financial markets by applying a panel data on a dataset of sovereign bonds issuance and public syndicated bank loans between 1980 and 2000. The result has shown that GDP per capita can determine the market access across countries.

2.3.3. Fiscal Flexibility and Performance

The third factor, fiscal flexibility and performance which can be measured general government final consumption expenditure which is all government current expenditures for purchases of goods and services (including compensation of employees)

Cordoba, Pujolas and Torres (2017) have determined the relationship between fiscal discipline - government expenditures and revenues and defaults using a general equilibrium model applying on Greek and German economies. The result has shown that fiscal disciplines along with the level of debt have determined default decisions of the government.

Peter N. Ireland (1993) has illustrated the effects of a deficit-financed tax cut to economic growth using a simple convex model of endogenous growth. The result has explained that in order to boost real economic growth, the government can reduce tax rates substantially. Moreover, in the long run, debt can be paid off by the government without increasing tax rate.

Fiaschi (1999) has explained that when the government increases the tax rate on labor income, there will be a positive effect on economic growth but provides a negative effect on income inequality. In contrast, the increasing tax rate on capital provides opposite results. The increasing tax rate on capital effects negatively on economic growth but effects positively in income inequality.

Zeyneloglu (2018) has illustrated the effect of the expansionary fiscal policy on economic growth using a dynamic stochastic general equilibrium (DSGE). In this model also applied a lump sum tax collected and a one-period real bond issued by the fiscal authority. In contrast to the endogenous growth model, the paper has assumed that the monetary authority has set the nominal interest rate by applying a Taylor rule. The paper has shown that when the government is conducting an expansionary fiscal policy under the golden rule, the economic growth will be higher. Therefore, when the government increases the tax rate, there will be a downturn in the economy.

2.3.4. Monetary Flexibility

Lastly, broad money growth can describe the fourth internal factor which is monetary flexibility. In a country, money base can be seen as the total amount of a currency that is either in general circulation in the hands of the public or in the commercial bank deposits held in the central bank's reserves. Therefore, the money base is to measure how fast the money base of a country is growing.

Malovana, Kolcunova and Bronz (2019) have illustrated the relationship between monetary policy and banks' perception of credit risk and the risk measurement of the bank under the internal ratings-based approach. The empirical result has shown that monetary policy has a significant impact on how banks measure credit defaults.

Sokolova (2015) has studied the monetary policy trade-off between low inflation and low sovereign risk under the circumstance where fiscal policymakers cannot ensure the substantiality of the government debt. The paper has applied the Fiscal Theory of Price level (FTPL) and the Fiscal Theory of Sovereign Risk (FTSR) and developed the baseline model where the central banks controls the risky interest rate to minimize the probability of default where the large inflation rises are ruled out. The result has shown that the changes in the information of the central banks' preferences over inflation have a direct impact on default risks significantly.

Schabert (2010) has illustrated the relationship between the government probability to default on its debts and different monetary policy regimes by applying a cash-in-advance model where the government does not have access to non-

distortionary taxation and does not account for initial debt. The result has shown that under the equilibrium where the money supply has been controlled, the money supply has an impact on the default risks.

2.3.5. Global Liquidity

However, the only external factor creating an impact on bond issuance is global liquidity. This paper will measure global liquidity by a country's current account receipt (CAR). The current account receipt can be defined as the sum of the balance of trade (goods and services exports minus imports), net income from abroad and net current transfers.

Longstaff, Francis A., Jun Pan, Lasse H. Pedersen, and Kenneth J (2011) have applied an extensive set of sovereign CDS data of developing countries to determine the nature of sovereign credit risk. The result has shown that there is a linkage between the probability of sovereign credit risk and global factors. There are 64 percent of the variation in sovereign credit spreads and the global factors. Moreover, sovereign credit spreads are likely to relate to the US stock and high-yield markets.

In this section, we have argued that there are five main factors, institutional effectiveness, economic structure and growth, fiscal flexibility, monetary flexibility and global liquidity, all have an impact on government bond issuance of a country, in terms of the amount or whether the country will issue bonds or not. In the next chapter, we will empirically see how much impact each factor affects the amount of international sovereign bond issuance from each country.

2.4. Cost of domestic bond and international bonds issuance

McBrady and Schill (2007) have illustrated a relationship between the deviations from CIP and proxies for uncovered interest rate parity to the bond issuance decision. They have focused on the opportunistic issuance by borrowers who are internationally active under the condition of the absence of foreign currency funding requirements. The result has shown that borrowers who are internationally active are likely to issue bonds in foreign currency in order to reduce the funding costs. In addition, the internationally active borrowers tend to arbitrage deviations from CIP and proxies for uncovered interest parity among major foreign currencies.

Becker et al (2005) have studied the characteristics of bond issuance by Australia and New Zealand. The result has shown that for Australia and New Zealand, it is common to issue international bonds offshore and swap the proceeds into local currency as a substitute for domestic bond issuance. It accounts for 80% of foreign currency liabilities in Australia and New Zealand that are hedged with financial derivatives.

Lastly, we will discuss the cost of international sovereign bond issuance. Takeuchi (2006) has demonstrated the effect of the availability of hedging instruments and liquidity in derivatives markets on onshore-offshore issuance decisions and the internationalization of bond markets. The result has shown that One of main factors in the ability of issuers to arbitrage price differentials is foreign exchange derivatives. For countries that have less liquidity on FX derivatives markets, the issuers are not willing to issue bonds in foreign currency as there can be a currency mismatch problem. In other words, if the hedging instruments are not

available, foreign investors are not likely to participate in the local bond market as they are not able to avoid currency risk. Therefore, countries that have less liquid FX market tend not to issue international bonds.

Black and Munro (2010) have applied a discrete choice (probit) model to demonstrate a variety of motivation for international bond issuance for five Asia-Pacific countries (Australia, Hong Kong, Japan, Korea and Singapore). The result suggested that deviations from covered interest parity are actively arbitrated by both minor currency country residents, as well as by internationally active borrowers among major currencies and issuers are likely to benefit from the liquidity and diversification of larger complete international markets.

Peristiani and Santos (2008) have focused on the issuance costs of issuing international bonds between the US domestic bond market and Eurobond market. The result of this paper has illustrated that even though the cost of issuance in the US bond market have decreased, the costs of issuing bonds in the euro market have declined even more. In addition, the costs of issuing bonds in the Eurobond market are now considered to be lower than that of the US bond market. Moreover, the result has suggested that the lower costs of issuing bonds in the Eurobond market are the result of the growing share of offshore issues by US firms.

Melnik and Nissim (2003) have illustrated the issue costs and initial pricing of international bonds by applying the three components in determining the issue costs - underwriter fee, underwriter spread (the difference between the offering price and the guaranteed price to the issuer) and underpricing (the difference between the market

price and the offering price). The result has shown that underwriters appear to determine some decision towards international bond issuance directly.

From the literature review session, we can conclude that there are various ways for the government to finance a country. This research has reviewed the taxation method, borrowing from IMF and bond issuance. We can see that the taxation method is one of the major sources to gain income for the government. However, the limitations of taxation method are limited tax base and tax rate especially for developing countries. developing countries, which are likely to have smaller tax bases as the households in developing countries are mostly lower income, cannot be able to collect sufficient income compared to developed countries. Moreover, the government of developing countries cannot increase tax rates as high as they want to as increasing tax rate does not help boost the economy but slowing down the economy instead.

Receiving funds from other institutions may help financing the economies of developing countries as financial institutions is likely to provide funds for developing countries. However, the literature has suggested four problems regarding receiving funds from other institutions. One is a moral hazard problem. The IMF tends to establish a biased decision both country decisions as well as money charged from countries who borrow money from the organization. Another problem is that funding received from other countries can be misleading. As lenders are likely to provide funds in the lenders' fields of interest not the interest of borrowers. Thirdly, there are specific conditions a country needs to follow in order to receive funds from the institutions or other countries. Borrowers need to be responsible for conditions lenders require resulting in borrowers losing their autonomy to control their decision on the

government's budget. Lastly, costs of borrowing sometimes can be increased by receiving funds from the institutions.

Issuing bonds both domestically and internationally are one of ways the government can choose to finance a country. Issuing domestic bonds is common for developed countries as the local investors are likely to participate in the local bond market as well as their currency especially for major currencies that have received credibility. On the other hand, for developing countries, not only their people are less participating in the local bond market, but foreign investors are also not interested in the local bond market especially for minor currency countries. Therefore, for developing countries, the government is likely to raise funds via foreign bond market.

There are both advantages and disadvantages towards raising funds in foreign bond market. One of the disadvantages is the cost of issuing bonds. When a country has issued bonds in foreign bond market, there will be cost on currency as well as hedging instruments. Therefore, countries that have less liquidity on FX derivatives markets, the issuers are not willing to issue bonds in foreign currency as there can be a currency mismatch problem. In other words, if the hedging instruments are not available, foreign investors are not likely to participate in the local bond market as they are not able to avoid currency risk. Nevertheless, the cost of raising funds from foreign bond market can be offset by the benefit a country can obtain. By raising funds in foreign bond markets, a country can fully finance the projects of their interest. However, in order to attract foreign investors, a country needs to qualify for some specific factors.

When countries issue international bonds, they have to consider how they can sell the bonds and the investors' willingness to buy their bonds. As if foreign investors are not willing to participate in the bond markets, not only a country has to pay for the cost of issuing bonds but also receive no funds. Therefore, this research would like to point out which factors have an impact on the decision of a government to issue bonds in foreign market. As for developing countries, issuing bonds in foreign market is likely to be a better choice to finance the country,

This research has applied the S&P global rating in order to consider the decision to issue international bonds of a country. As the S&P is a rating agency who provides a rating for countries, investors tend to consider a rating provided by S&P in order to make a decision to participate in the bond markets. In other words, foreign investors are likely to invest in bond market of a country that obtains higher rating from rating agency as investors can avoid default risk when they invest in the bond market. In addition, as there is no research considering the factors provided by S&P global rating, this research would like to see which factors provided by S&P Global rating determine international bond issuance decisions of a country as well as provide information for a country in order to improve such factors to attract more foreign investors.

3. Conceptual Framework

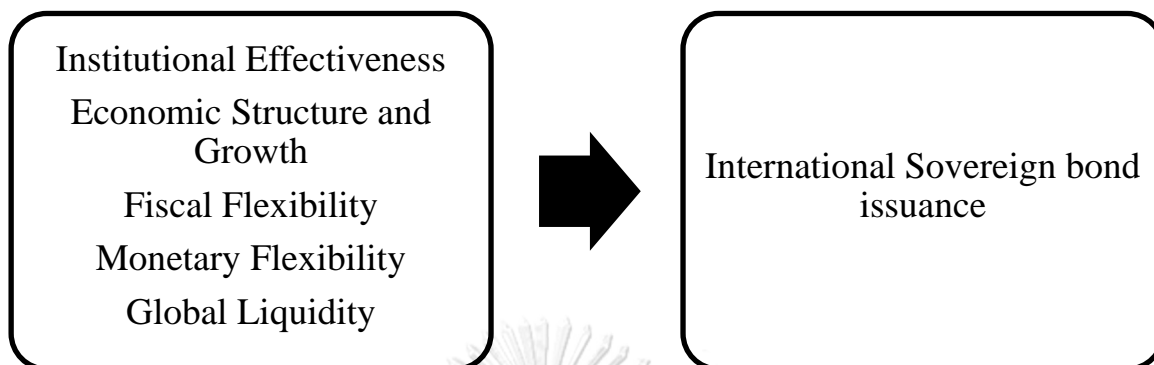


Figure 4 Conceptual framework

The scope of this research is to study the determinant of international sovereign bond financing in developing countries. The data set is international sovereign bond which was issued between 1996 - 2016 by developing countries in ASEAN, Latin America, Eastern Europe and Sub-Saharan Africa as countries in these regions are considered to be emerging economies and they account for most of the international bond issuers in foreign bond markets. .

There are five main key factors in determining sovereign credit rating. (Sovereign Rating Methodology, S&P Global Rating, 2014) - institutional effectiveness, fiscal flexibility and performance, economic structure and growth, monetary flexibility and global liquidity. This methodology applies to issuer and issue ratings on all sovereign governments.

3.1. Specific Terms and Definitions

3.1.1. International Sovereign Bond

According to Chapter 3 - Bond Settlement in Clearing Settlement and Custody (Second Edition) by David Loader (2014), International bond issues are debt securities sold largely outside the country of residence of the borrower. This group may be subdivided into Eurobonds, which are referred to as international bonds to avoid confusion with the Euro currency, and foreign bonds.

International Bonds are underwritten by an international syndicate of commercial and investment banks and sold principally in the country of issuer other than the country of the currency in which they are issued. For example, a non-US issuer would like to issue bonds in US dollars outside the USA. The issue is underwritten by an international syndicate and initially distributed and subsequently sold outside the USA.

Therefore, international sovereign bonds can be defined as international bonds which are issued by the government in other major currencies such as US dollar or Japanese Yen. The main investors are in the global bond market.

3.1.2. Domestic Sovereign Bond

According to Chapter 3 - Bond Settlement in Clearing Settlement and Custody (Second Edition) by David Loader (2014), Domestic bonds are issued by borrowers' resident in the country of issue, denominated in their local currency and regulated by the local authorities. Some of the largest borrowers in the domestic markets are the governments and government agencies plus, to a lesser extent, corporate entities.

Therefore, Domestic Sovereign Bonds are domestic bonds issued by the local government in local currency and regulated by the local authorities. The main investors are in the local bond market.

3.1.3. Institutional Effectiveness

According to S&P Global rating, the institutional effectiveness explains a country's effectiveness and stability of its political institution as well as transparency and accountability of policymaking.

In this research, institutional effectiveness can be described as government effectiveness. According to the World Bank, government effectiveness can be explained as the perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation as well as the credibility of the government's commitment to such policies.

3.1.4. Fiscal Flexibility and Performance

According to S&P Global rating, fiscal flexibility and performance can reflect the sustainability of a sovereign's deficits and debt burden.

Fiscal Flexibility and Performance in this research can be determined by the prospective change in General Government Final Consumption Expenditure. Which is all government current expenditures for purchases of goods and services (including compensation of employees)

3.1.5. Economic Structure and Growth

According to S&P Global rating, economic structure and growth can be driven by income levels, growth prospects and economic diversity and volatility. The following factors can enhance a country's economic growth and income level.

This research has applied GDP growth as a proxy to measure economic growth prospects.

3.1.6. Monetary Flexibility

According to S&P Global rating, monetary flexibility can determine that the country's monetary authority can fulfill its mandate while supporting sustainable economic growth and recovering from economic or financial crises. In this research, the monetary flexibility can be described as broad money growth.

3.1.7. Global Liquidity

According to S&P Global rating, global liquidity can be defined as a country's ability to obtain funds from abroad to meet its public and private sector. It can refer to the transactions and positions of people in the country, the flow, the stocks and trade.

This research will measure global liquidity by a country's current account receipt (CAR). The current account receipt can be defined as the sum of the balance of trade (goods and services exports minus imports), net income from abroad and net current transfers.

3.1.8. Official Development Assistance (ODA)

According to OECD, the OECD Development Assistance Committee (DAC) has explained that Official development assistance (ODA) is a government aid that promotes the development of the economies and welfare of developing countries. The DAC adopted ODA as the “gold standard” of foreign aid in 1969 and it remains the main source of financing for development aid.

ODA flows to countries and on the countries listed by the DAC List as the Recipients and to multilateral development institutions which are:

1. Provided by official agencies, including state and local governments, or by their executive agencies
2. Concessional (i.e. grants and soft loans) and administered with the promotion of the economic development and welfare of developing countries as the main objective.

3.1.9. Multilateral development banks

According to [Multilateral Development Banks: Overview and Issues for Congress](#) by Congressional Research Service, Multilateral development banks (MDBs) are international institutions that provide financial assistance in the form of loans and grants to developing countries for investment projects and policy-based loans in order to promote economic and social development. Project loans include large infrastructure projects, such as highways and dams, as well as social projects, including health and education projects. Policy-based loans provide financial assistance to the governments exchange for agreement by the borrower country government with specific conditions.

The MDBs normally provide two major funds - lending windows or lending facilities. One type of lending window is primarily used to provide financial assistance on market-based terms which can be provided in the form of loans as well as equity investments and loan guarantees. The other type of lending window is used to provide financial assistance at below market-based terms, typically in the form of loans at below-market interest rates and grants, to governments of low-income countries.

The five major MDBs include the World Bank and four regional development banks - the African Development Bank (AfDB), the Asian Development Bank (AsDB), the European Bank for Reconstruction and Development (EBRD) and the Inter-American Development Bank (IDB).

3.2. Institutional Effectiveness

3.2.1. Description

The institutional effectiveness explains a country's effectiveness and stability of its political institution as well as transparency and accountability of policymaking. institutional effectiveness can be described as government effectiveness or in other word, according to World Bank, the perceptions of the quality of public services, the quality of the civil service and the degree of its, the independence from political pressures, the quality of policy formulation and implementation as well as the credibility of the government's commitment to such policies

3.2.2. Expected Sign

The sign for institutional effectiveness is expected to be “positive” as a better quality of government and institutional effectiveness can increase likelihood of a country to participate in the global bond market R. Gaston Gelos, Ratna Sahay, Guido Sandleris (2011). In addition, the higher the government effectiveness and the lower the corruption the government can be, the more investors are willing to invest in its international sovereign bonds as they see that the government has higher creditworthiness and ability to pay off the debt.

3.3. Economic Structure and Growth

3.3.1. Description

Economic structure and growth can be driven by income levels, growth prospects and economic diversity and volatility. The following factors can enhance a country’s economic growth and income level. This research is using GDP growth to measure economic growth prospects.

3.3.2. Expected Sign

The sign of economic structure and growth is expected to be “positive” as a country with lower GDP growth is likely not to participate much in the global bond market. As the likelihood of a country to default increases when a country is in a recession or when a country develops a low level of income as a country is likely to not repay the debt, investors do not demand to invest in bonds issued by those countries. Arellano Cristina (2008)

3.4. Global Liquidity

3.4.1. Description

The external factor reflects a country's ability to obtain funds from abroad to meet its public and private sector. It can refer to the transactions and positions of people in the country, the flow, the stocks and trade. global liquidity has related to the degree to which a country has a better control on reserve currency or actively traded currency. This research will measure global liquidity by a country's current account receipt (CAR). The current account receipt can be defined as the sum of the balance of trade (goods and services exports minus imports), net income from abroad and net current transfers.

3.4.2. Expected Sign

The sign of global liquidity is expected to be "Positive" as Arellano Cristina (2008) have shown that a country with smaller terms of trade is not likely to participate in the global bond market. As a country has less participation in the Global market, a country tends not to participate in the global bond market as well. In addition, global bond market has less or no information on the credit rating of a country, so less investors are not willing to invest in those bonds.

3.5. Fiscal Flexibility and Performance

3.5.1. Description

Fiscal flexibility and performance can reflect the sustainability of a sovereign's deficits and debt burden. It can be determined by the prospective change in general government final consumption expenditure which is all government current expenditures for purchases of goods and services (including compensation of employees)

3.5.2. Expected Sign

The sign of fiscal flexibility and performance is expected to be “positive” as Cordoba, Pujolas and Torres (2017) have determined the relationship between fiscal discipline - government expenditures and revenues and defaults and the result has shown that fiscal disciplines along with the level of debt have determined default decisions of the government. Therefore, when the government increases its expenditure, the government is likely to issue more bonds.

3.6. Monetary Flexibility

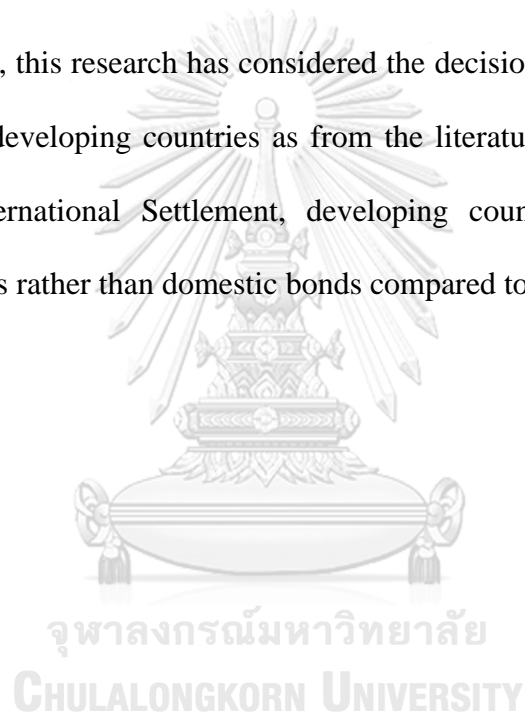
3.6.1. Description

Monetary flexibility can determine that the country's monetary authority can fulfill its mandate while supporting sustainable economic growth and recovering from economic or financial crises. In this research, the monetary flexibility can be described as broad money growth.

3.6.2. Expected Sign

The sign of monetary flexibility is expected to be “negative” as Claessens et. al (2003) has illustrated that the economies with broad financial systems, which can be measured by bank deposits and stock market capitalization, will likely issue more sovereign bonds rather than foreign currency bonds. However, foreign investor demand is certainly associated with size and amount of foreign currency bonds.

In addition, this research has considered the decision to issue bonds in foreign bond markets of developing countries as from the literature and data obtained from the Bank of International Settlement, developing countries are likely to issue international bonds rather than domestic bonds compared to developed countries.



4. Research methodology

Another way to finance a country without hurting the economy as well as its people is to borrow from others by issuing international bonds. Unlike domestic bonds which have been issued in a country's currency, international sovereign bonds can be said to be bonds issued by a government not in terms of its currency but international major currencies such as the US dollar or Japanese Yen – developed country. For example, international sovereign bonds issued by Thai government will be in US dollars rather than Thai baht.

Domestic bonds can be issued by developed countries easily as their people have a specific level of income to invest in the financial market. However, for developing countries, issuing domestic bonds is unlikely to achieve. developing countries where there is high unemployment and poverty, their people are believed to have a lower level of income-lower saving and investment as there is not enough income to achieve a standard of living. Therefore, instead of issuing domestic bonds, issuing international bonds - raising funds from investors from other countries is surely a better channel to finance a country.

This study aims to examine how external and internal factors, which are institutional effectiveness, economic structure and growth, Fiscal Flexibility, monetary flexibility and global liquidity, affect the probability of a country to issue government bonds. In order to provide a detailed analysis of the probability of bond issuance, this research applied a discrete choice logit model for binary choice (yes, no) responses to the determinant of bond issuance.

4.1. Statements of Hypotheses

4.1.1. Statements of Hypotheses

Hypothesis 1: Institutional effectiveness is positive related to international sovereign bond issuance.

Hypothesis 2: Economic structure and growth is positive related to international sovereign bond issuance.

Hypothesis 3: Global liquidity is positive related to international sovereign bond issuance.

Hypothesis 4: Fiscal flexibility and performance is positive related to international sovereign bond issuance.

Hypothesis 5: Monetary flexibility is negative related to international sovereign bond issuance.

4.2. Research Methodology

4.2.1. Linear Probability Model

Without heterogeneity, a linear model can be considered as

$$y_{it} = \beta x_{it} + \mu_{it}$$

Assuming $\sum \mu_{it} = 0$, we have that $\sum y_{it} = \sum P_{it} = \beta \sum x_{it}$ and $\text{Var}(y_{it}) = \beta x_{it} (1 - \beta x_{it})$. Linear Probability Models (LPM) are widely used due to the better parameter interpretations. For large data sets, the computational simplicity of OLS estimators is more attractive than other complex regression. Moreover, OLS estimators for β have desirable properties. It can be explained that it is consistent and asymptotically normal under mild conditions on the explanatory variables (x_{it}).

However, LPM has some drawbacks which include the following:

1. The expected response is a probability and thus must vary between 0 and 1. However, the linear combination βx_{it} can vary between negative and positive infinity.
2. Linear models assume homoscedasticity which the variance of the response depends on the mean that varies over observations. This problem has been known as heteroscedasticity.
3. The response must be either 0 or 1 although the regression models typically regard distribution of the error term as continuous.

4.2.2. Logistic regression model

To circumvent the drawbacks of LPM, this research have applied an alternative model in which can express the expectation of the response as a function of explanatory variables, $p_{it} = T(\beta x_{it}) = \text{Prob}(y_{it} = 1 | x_{it})$. There are two special cases of the function $T(\cdot)$ the Logistic regression.

The Logit case can be justified by appealing to the threshold interpretation of the model. Under the threshold interpretation, the propensity can be observed across a threshold.

$$y_{it} = \{0, 1\}$$

To see how the Logit case can be derived from the threshold, a Logit distribution can be described as following:

$$\text{Prob}(\mu_{it} \leq \alpha) = \frac{1}{[1 + \exp(-)]}$$

The Logit model uses a cumulative distribution function of the logistic distribution. Moreover, the coefficients in the Logit model can be described in terms of odds ratio.

An advantage of the Logit regression is that it permits closed-form expressions, unlike the normal distribution function. To interpret the regression coefficients in the logistic regression model, $\beta = (\beta_1, \beta_2, \dots, \beta_k)'$, the explanatory variables can be assumed to be 0 or 1.

4.2.3. Panel data

Panel data is a dataset where the behavior of the entity is observed overtime.

The panel data can be described as the following:

Country	Year	Y	X ₁	X ₂
A	2000	Y _{A2000}	X _{1A2000}	X _{2A2000}
A	2001	Y _{A2001}	X _{1A2001}	X _{2A2001}
A	2002	Y _{A2002}	X _{1A2002}	X _{2A2002}
B	2000	Y _{B2000}	X _{1B2000}	X _{2B2000}
B	2001	Y _{B2001}	X _{1B2001}	X _{2B2001}
B	2002	Y _{B2002}	X _{1B2002}	X _{2B2002}
C	2000	Y _{C2000}	X _{1C2000}	X _{2C2000}
C	2001	Y _{C2001}	X _{1C2001}	X _{2C2001}
C	2002	Y _{C2002}	X _{1C2002}	X _{2C2002}

Figure 5 Panel data

By applying a panel data, variables that are not being observed or measured such as cultural factors or immeasurable factors as well as variables that change over time can be controlled. Panel data can benefit for a model when the model has suspected that the dependent variable depends on independent variables which are not observed but correlated with the dependent variable.

Consider the multiple linear regression model for individual $i = 1, \dots, N$ who is observed at several time periods $t = 1, \dots, T$

$$y_{it} = \alpha + X_{it}\beta + Z_{iy} + C_i + U_{it}$$

where y_{it} is the dependent variable, x_{it} is a K-dimensional row vector of time-varying explanatory variables and z_i is a M-dimensional row vector of time-invariant explanatory variables excluding the constant, α is the intercept, β is a K-dimensional column vector of parameters, γ is a K-dimensional column vector of parameters, c_i is an individual-specific effect and u_{it} is an idiosyncratic error term.

There are two types of panel data regression - Random effects and Fixed effects. A random effect is a model in which the variables across the regression are assumed to be random and uncorrelated. The important difference between Fixed effects and Random effects is whether the unobserved individual characters are correlated with the variable X or not. (Green, 2008)

4.2.4. Random Effects

In the random effects model, the individual-specific effect is a random variable that is uncorrelated with the explanatory variables.

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it} + \varepsilon_{it}$$

Where

– α_i ($i=1\dots n$) is the unknown intercept for each entity (n entity-specific intercepts).

– Y_{it} is the dependent variable (DV) where i = entity and t = time.

– X_{it} represents one independent variable (IV)

- β_1 is the coefficient for that IV, and
- u_{it} is between-entity error term
- ε_{it} is within-entity error term

The regression assumes that the individual-specific effect is a random variable that is uncorrelated with the explanatory variables of all past, current and future time periods of the same individual. Random effects assume that the error term is not correlated with the independent variables. In other words, the variation across entities is assumed to be random and uncorrelated with the independent variables; therefore, in random-effects, individual characteristics which may or may not influence the independent variables need to be specified which are unable to detect, resulting in omitted variable bias in the model.

4.2.5. Fixed Effects

The equation for the fixed effects model can be the following:

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it}$$

Where

- α_i ($i=1\dots n$) is the unknown intercept for each entity (n entity-specific intercepts).
- Y_{it} is the dependent variable (DV) where i = entity and t = time.
- $\beta_1 X_{it}$ represents one independent variable (IV)

- β_1 is the coefficient for that IV, and
- u_{it} is the error term

Fixed effects explain the relationship between independent and dependent variables within an entity. Each entity has its own individual characteristics that may influence the independent variables. Fixed effects have been applied when an individual is assumed to influence other variables. By using fixed effects, control variables will not be captured as in the Fixed effect model, control variables will cancel each other out.

In this research, the fixed effect estimation has been applied as control variables are unmeasurable and similar overtime and those variables are considered to be correlated with the independent variables and dependent variables.

4.2.6. Panel data-Logit Fixed Effect model

Although binary dependent variable models can be estimated by OLS, in which case they are known as linear probability models (LPM), OLS is not the preferred method of estimation for such models because of two limitations, namely, that the estimated probabilities from LPM do not necessarily lie in the bounds of 0 and 1 and also because LPM assumes that the probability of a response moves linearly with the level of the explanatory variable, which is counterintuitive. One would expect the rate of increase in probability to taper off after some point. Binary response regression models can be estimated by the Logit or Probit models. Gujarati (2014)

The Logit model is a statistical probability model with two categories in the dependent variable. Logit analysis is based on the cumulative normal probability distribution. The binary dependent variable takes on the values of zero and one. The Logit analysis provides statistically significant findings of which factors increase or decrease the probability of government bond issuance.

In the binary Logit model, the probability of issuing government bond was taken as 1, while the probability of not issuing government bond as 0

Charbonneau (2014) has indicated the panel data-logit fixed effect model by considering a simple logit model with two fixed effects.

The equation has been generated by:

$$y_{it} = 1\{x'_{it}\beta + \alpha_i + \varepsilon_{it} \geq 0\} \quad i = 1, \dots, n,$$

where for all i and t the ε_{it} are independent, having a logistic distribution conditional on the x 's and the individual fixed effect α .

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

This implies that we can indicate the following equation:

$$\Pr(y_{i1} = 1 \mid x_{i1}, x_{i2}, \alpha_i) = \frac{\exp(x'_{i1}\beta + \alpha_i)}{1 + \exp(x'_{i1}\beta + \alpha_i)}$$

Therefore, we can see that the fixed effect will be eliminated the likelihood condition:

$$\begin{aligned}
& \Pr(y_{i1} = 1 \mid y_{i1} + y_{i2} = 1, x_{i1}, x_{i2}, \alpha_i) \\
&= \frac{\Pr(y_{i1} = 1 \mid x_{i1}, x_{i2}, \alpha_i) \Pr(y_{i2} = 0 \mid x_{i1}, x_{i2}, \alpha_i)}{\Pr(y_{i1} = 1, y_{i2} = 0 \mid x_{i1}, x_{i2}, \alpha_i) + \Pr(y_{i1} = 0, y_{i2} = 1 \mid x_{i1}, x_{i2}, \alpha_i)} \\
&= \frac{\exp(x_{i1} - x_{i2})' \beta}{1 + \exp(x_{i1} - x_{i2})' \beta}
\end{aligned}$$

We can apply the function to all pairs of equations for a given individual to generate an estimator for parameter β , which can be generalized to the case where $T > 2$. In addition, we are conditioning on $y_{i1} + y_{i2} = 1$, which indicates that we are using the information contained in pairs of equations where the binary indicator changed. It is possible to obtain a likelihood function when $T > 2$, by conditioning on $\sum_{t=1}^T y_{it}$ to obtain the conditional distribution:

$$P\left(y_{i1}, \dots, y_{iT} \mid \sum_{t=1}^T y_{it}, x_{i1}, \dots, x_{iT}, \alpha_i\right) = \frac{\exp(\sum_{t=1}^T y_{it} x'_{it} \beta)}{\sum_{(d_1, \dots, d_T) \in B} \exp(\sum_{t=1}^T d_{it} x'_{it} \beta)}$$

with B being the set of all sequences of zeros and ones that have $\sum_{t=1}^T d_{it} = \sum_{t=1}^T y_{it}$.

Therefore, we can now indicate that a similar approach can be used in the case of two fixed effects in a logit model and provide an analogous result.

Suppose that the observations are now given by:

$$y_{ij} = 1\{x'_{ij}\beta + \mu_i + \alpha_j + \varepsilon_{ij} \geq 0\} \quad i = 1, \dots, n, j = 1, \dots, n$$

where μ_i and α_j are the fixed effects and ε_{ij} follows a logistic distribution. Thus, by applying the method used above to eliminate one fixed effect, we can write the following probabilities:

$$Pr(y_{lj} = 1 \mid x, \mu, \alpha, y_{lj} + y_{lk} = 1) = \frac{\exp[(x_{lj} - x_{lk})'\beta + \alpha_j - \alpha_k]}{1 + \exp[(x_{ij} - x_{ik})'\beta + \alpha_j - \alpha_k]} \quad (5)$$

and

$$Pr(y_{ij} = 1 \mid x, \mu, \alpha, y_{ij} + y_{ik} = 1) = \frac{\exp[(x_{ij} - x_{ik})'\beta + \alpha_j - \alpha_k]}{1 + \exp[(x_{ij} - x_{ik})'\beta + \alpha_j - \alpha_k]} \quad (6)$$

From the two equations above, we can see that the two equations do not depend on the μ fixed effects. However, they are still presented in terms of the α 's. From the equation (5) and (6), we can describe a logit with $(x_{ij} - x_{ik})$ as an explanatory variable and $(\alpha_j - \alpha_k)$ as a fixed effect.

So, by using both equations (5) and (6) we can compare to another pair of equation by applying the same fixed effect and generating:

$$c \equiv \{y_{1j} + y_{1k} = 1, y_{ij} + y_{ik} = 1\}$$

we can now write the following conditional probability:

$$\begin{aligned}
 & \Pr(y_{ij} = 1 \mid x, \mu, \alpha, y_{lj} + y_{lk} = 1, y_{ij} + y_{ik} = 1, y_{ij} + y_{lj} = 1) \\
 &= \frac{\Pr(y_{1j} = 1, y_{ij} + y_{lj} = 1 \mid x, \mu, \alpha, c)}{\Pr(y_{1j} + y_{ij} = 1 \mid x, \mu, \alpha, c)} \\
 &= \frac{\Pr(y_{1j} = 1 \mid x, \mu, \alpha, c) \Pr(y_{ij} = 0 \mid x, \mu, \alpha, c)}{\Pr(y_{1j} = 1, y_{ij} = 0 \mid x, \mu, \alpha, c) + \Pr(y_{1j} = 0, y_{ij} = 1 \mid x, \mu, \alpha, c)} \\
 &= \frac{\exp[(x_{1j} - x_{1k})'\beta + \alpha_j - \alpha_k]}{\exp[(x_{1j} - x_{1k})'\beta + \alpha_j - \alpha_k] + \exp[(x_{ij} - x_{ik})'\beta + \alpha_j - \alpha_k]} \\
 &= \frac{\exp[(x_{1j} - x_{1k}) - (x_{ij} - x_{ik})'\beta]}{1 + \exp[(x_{1j} - x_{1k}) - (x_{ij} - x_{ik})'\beta]}
 \end{aligned}$$

The probability no longer depends on the fixed effects.

This research has applied panel data-logit fixed effect model as by applying the panel data-logit fixed effect model, the endogeneity problem can be eliminated. In the fixed effect model, the control variables where control variables are unmeasurable and similar overtime will not be captured as each variable will cancel each other out.

The panel data-logit fixed effect model can be written by:

$$\text{Prob (SBI} = 1)_{it} = \varphi (\Sigma k \text{ FACTORS}_{ik} ; \text{Controls}_{jt})$$

The Factors in the Logit Model are

1. Institutional Effectiveness: The Government Effectiveness (Geff)
2. Economic Structure and Growth: GDP growth (GDP)
3. Fiscal Flexibility: General Government Final Consumption Expenditure (Gcon)
4. Monetary Flexibility: Broad money Growth (broadmoney)
5. Global Liquidity: Trade (trade)
6. The Controls in the Logit Model are unmeasurable and similar overtime

4.3. Data Measurement and Sources

Variables	Measurement of Variables	Data source
PROB	Sovereign a Bond Issuance	Bloomberg
INSTU	Institutional effectiveness proxied by Government Effectiveness	World Bank's Worldwide Governance Indicators [WGI]
ECON	Economic structure and growth proxied by GDP growth (% of GDP)	World Bank's Worldwide Development Indicators [WDI]
GLOBAL	Global liquidity proxied as Term of Trade	World Bank's Worldwide Development Indicators [WDI]
FISCAL	Fiscal flexibility and performance proxied as Final Consumption of Government Expenditure	World Bank's Worldwide Development Indicators [WDI]
MONET	Monetary flexibility proxied as Broadmoney Growth (% of GDP)	World Bank's Worldwide Development Indicators [WDI]

4.4. Expected Signs of the Hypotheses and Reason underlying the Signs

Table 5 Expected Relationships in the Estimation Model

Variables	Description of Variables	Expected Sign	Explanation of Sign
Institutional Effectiveness	A country's effectiveness and stability of its political institution as well as transparency and accountability of policymaking	Positive	A better quality of government and institutional effectiveness can increase likelihood of a country to participate in the global bond market Hsien-Yi Chen and Sheng-Syn Chen (2018)
Economic Structure and Growth	Income levels, growth prospects and economic diversity and volatility	Positive	A higher GDP Growth country is likely to issue more international sovereign bond than a lower GDP growth country. David A. Grigorian (2003)
Fiscal Flexibility	The sustainability of the government's deficits and debt burden.	Positive	When the government increases its expenditure, the government is likely to issue more international sovereign bonds. Cordoba, Pujolas and Torres (2017)
Monetary Flexibility	Broad money growth	Negative	A country with broad financial systems is likely to issue less international sovereign bonds. David A. Grigorian (2003)
Global Liquidity	A country's ability to obtain funds from abroad to meet its public and private sector. It can refer to the transactions and positions of people in the country, the flow, the stocks and trade.	Positive	A country with high ability to obtain funds from abroad is likely to issue more international sovereign bonds. David A. Grigorian (2003)

4.5. Variables and Country Characteristics

4.5.1. Country Characteristics

	Issue	No
GDP per Capita	5,185.77	3,641.82
Population	37,023,695.50	11,289,326.92
Landlocked Country (% of total)	6%	30%

Table 6 Comparison between developing countries that issue international sovereign bond issuance and developing countries that do not issue

The comparison between has shown that by applying an average GDP per Capita and an average population, a country that issues international sovereign bonds tends to have a bigger economy than a country that does not issue international sovereign bonds. However, when we measure a landlocked country, we can see that there are only 6% of countries that issue international sovereign bonds that are landlocked countries, whereas the percentage of countries that do not issue international sovereign bonds is 30. In other words, we can say that countries that issue international sovereign bonds are more accessible to the sea than countries that do not issue them.

1996						
Country	Population	Government Effectiveness	GDP Growth	General government final consumption expenditure (% of GDP)	Trade	Broadmoney Growth
Argentina	35,419,682	0.166	5.527	12.502	21.506	18.821
Belize	213,676	0.389	1.429	14.141	100.269	7.582
Bosnia and Herzegovina	3,780,378	-1.192	88.958	0.000	107.500	0.000
Brazil	164,913,306	-0.143	2.208	19.751	15.636	31.035
Chile	14,497,826	1.338	6.803	10.992	54.768	20.094
Colombia	38,049,038	-0.459	2.056	18.465	36.044	21.028
Congo, Dem. Rep.	42,770,544	-1.650	-1.023	6.201	60.316	0.000
Costa Rica	3,596,732	0.468	1.238	13.061	84.492	47.587
Cote d'Ivoire	14,995,249	-0.261	7.729	10.460	73.519	3.927
Croatia	4,494,000	0.102	5.874	22.494	67.989	49.235
Cyprus	873,423	1.172	1.333	12.764	140.852	0.000
Ecuador	11,683,479	-0.475	1.732	10.875	44.216	12.429
El Salvador	5,671,925	-0.692	1.706	9.348	55.008	13.801
Gabon	1,113,994	-0.199	3.625	11.241	95.671	17.221
Ghana	17,185,608	-0.120	4.602	12.044	72.205	39.198
Guatemala	10,646,674	-0.455	2.958	5.080	40.393	5.726
Honduras	5,867,849	-0.744	3.595	9.539	98.819	38.846
Indonesia	199,914,831	-0.705	7.818	7.107	49.087	27.081
Kenya	28,147,734	-0.521	4.147	15.181	57.312	25.325
Mexico	95,687,452	0.225	5.875	12.455	50.724	27.011
Montenegro	611,003	0.000	0.000	0.000	0.000	0.000
Namibia	1,706,489	0.432	3.191	25.043	97.618	24.075
Nicaragua	4,700,779	-0.570	6.344	7.345	48.483	52.526
Nigeria	110,732,904	-0.924	4.994	10.017	57.691	16.178
Panama	2,796,344	0.224	4.080	14.295	156.007	7.309
Paraguay	4,870,694	-0.909	1.574	9.626	103.035	9.809
Peru	24,441,074	0.034	2.799	10.359	31.654	37.245
Philippines	71,446,107	-0.313	5.846	11.948	89.800	23.732
Senegal	8,974,077	0.076	2.012	13.841	59.749	11.693
Serbia	7,617,794	-1.065	2.426	18.042	42.081	0.000
South Africa	42,210,216	1.020	4.307	19.145	46.667	14.279
Thailand	60,151,472	0.180	5.652	11.584	84.274	10.620
Ukraine	51,057,189	-0.670	-10.000	21.759	93.857	35.129
Venezuela, RB	22,650,102	-0.541	-0.198	5.013	57.841	68.807
Vietnam	73,156,700	-0.581	9.340	8.353	92.706	25.795
Zambia	9,394,304	-1.128	6.219	0.000	63.821	35.009

Table 7 Country Characteristics in 1996

2016						
Country	Population	Government Effectiveness	GDP Growth	General government final consumption expenditure (% of GDP)	Trade	Broadmoney Growth
Argentina	43,847,430	0.177	-2.245	18.432	26.266	41.549
Belize	366,954	-0.676	-0.594	0.000	0.000	2.649
Bosnia and Herzegovina	3,516,816	-0.433	3.056	20.958	87.707	8.314
Brazil	207,652,865	-0.176	-3.595	20.180	24.614	11.812
Chile	17,909,754	1.018	1.589	13.540	56.087	4.902
Colombia	48,653,419	0.023	1.960	18.396	34.916	7.187
Congo, Dem. Rep.	78,736,153	-1.505	2.424	12.854	60.236	20.346
Costa Rica	4,857,274	0.355	4.329	17.344	63.524	3.160
Cote d'Ivoire	23,695,919	-0.668	8.336	11.491	52.587	11.047
Croatia	4,170,600	0.485	2.982	19.213	96.281	4.567
Cyprus	1,170,125	0.979	3.032	15.060	131.390	0.000
Ecuador	16,385,068	-0.432	-1.576	14.372	38.830	17.535
El Salvador	6,344,722	-0.279	2.366	12.071	64.212	3.072
Gabon	1,979,786	-0.790	2.262	14.878	68.154	-4.003
Ghana	28,206,728	-0.202	3.577	17.677	88.602	22.499
Guatemala	16,582,469	-0.604	3.067	9.771	46.822	6.350
Honduras	9,112,867	-0.733	3.610	14.506	100.749	13.214
Indonesia	261,115,456	0.014	5.016	9.450	37.387	10.028
Kenya	48,461,567	-0.314	5.849	13.641	37.929	3.668
Mexico	127,540,423	0.145	2.286	12.208	78.113	11.436
Montenegro	622,781	0.104	2.949	19.612	103.384	10.488
Namibia	2,479,713	0.171	1.082	24.902	108.177	4.901
Nicaragua	6,149,928	-0.698	4.702	8.264	95.932	11.043
Nigeria	185,989,640	-1.087	-1.617	0.000	0.000	11.552
Panama	4,034,119	0.186	4.882	10.606	94.340	0.000
Paraguay	6,725,308	-0.771	4.020	11.874	81.271	7.350
Peru	31,773,839	-0.171	3.882	13.313	44.805	12.788
Philippines	103,320,222	-0.013	6.924	11.127	64.899	13.326
Senegal	15,411,614	-0.467	6.742	15.839	72.906	13.724
Serbia	7,057,412	0.091	2.797	15.988	107.498	9.876
South Africa	55,908,865	0.272	0.279	20.592	60.375	6.079
Thailand	68,863,514	0.335	3.238	17.094	123.072	4.203
Ukraine	45,004,645	-0.583	2.308	19.370	104.807	10.929
Venezuela, RB	31,568,179	-1.293	0.000	0.000	0.000	0.000
Vietnam	92,701,100	0.010	6.211	6.510	184.686	17.880
Zambia	16,591,390	-0.658	3.610	15.989	73.575	-5.702

Table 8 Country Characteristics in 2016

From the country characteristics table between 1996 and 2016, we can see that government effectiveness, GDP growth, general government final consumption expenditure, and trade of selected developing countries has mostly increased between two periods. On the other hand, broad money growth between 1996 and 2016 of

selected developing countries has mostly decreased. The country characteristics table has shown that the data has matched with the hypotheses proposed by this research as well as the results shown in literature review section.

4.5.2. Summary table of the five main key factors

Issue (at least once)	Mean	S.D	Min	Max
Geff	-0.216	0.56	-1.323	1.564
Gcon	11.547	3.45	5.12	24.759
broadmoney	169.27	4067	-99.875	108613.3
trade	79.948	32.42	15.636	184.686
gdp	3.864296	4.99	-14.8	88.958

Table 9 Summary Table of Variables of countries that issue international bond at least once

Issue (No)	Mean	S.D	Min	Max
Geff	-0.492	0.8	-2.446	2.437
Gcon	15.23	8.05	0	84.508
broadmoney	23.352	138.36	-88.789	4105.573
trade	88.772	67.89	0.167	531.737
gdp	5.116	8.3	-36.7	149.973

Table 10 Summary Table of Variables of countries that never issue international bond

From the summary tables above, the result can be interpreted that countries that issue international sovereign bond at least once have a higher average of government effectiveness (Geff) which means that those countries tend to have lower rates of corruption and better quality of public services. Furthermore, the countries

that issue international sovereign bonds tend to have higher average growth rate of Broadmoney (broadmoney). In other words, the growth rate of money base in countries which issue international sovereign bond at least once are higher.

On the other hand, the general government final consumption expenditure (Gcon), trade (trade) and GDP growth (gdp) has no difference between countries that issue and those that do not issue international sovereign bonds.



5. Results

As the global bond market has been growing, this research has studied the determinant of International Bond issuance by developing countries in ASEAN, Latin America, Eastern Europe and Sub-Saharan Africa. There are five main key factors in determining sovereign credit rating. Sovereign Rating Methodology, S&P Global Rating (2014) - institutional effectiveness, fiscal flexibility and performance, economic structure and growth, monetary flexibility and global liquidity. This methodology applies to issuer and issue ratings on all sovereign governments.

This research has used the logit-fixed effect model to determine which factors affect the issuance of international sovereign bonds in ASEAN, Eastern Europe, Latin America and Sub-Saharan Africa. Fixed effects explain the relationship between independent and dependent variables within an entity. Each entity has its own individual characteristics that may influence the independent variables. Fixed effects have been applied when an individual is assumed to influence other variables. By using fixed effects, control variables will not be captured as in the Fixed effect model, control variables will cancel each other out.

The result has shown that only 35 out of 36 countries can be calculated. The coefficient of each factor has been shown under the Coef column and the z value has been shown under z column. Nevertheless, the findings have shown that factors that affect the likelihood of a developing country to issue international sovereign bonds significantly are government effectiveness (Geff) and GDP growth (gdp).

5.1. Result from logit-fixed effect Model

The results are as the following:

Logit Model, Fixed Effect ; n = 35/36			
	Coef	z	p value
Geff	0.699	1.76	0.078
Gcon	0.18	0.29	0.773
broadmoney	-0.007	-0.97	0.331
trade	0.001	0.08	0.935
gdp	0.282	0.98	0.329

Table 11 Logit-fixed effect result (1)

Logit Model, Fixed Effect ; n = 35/36			
	Margin	z	p value
Geff	0.167	1.86	0.063
Gcon	0.004	0.29	0.769
broadmoney	-0.002	-0.96	0.337
trade	0.0001	0.08	0.935
gdp	0.007	0.99	0.222

Table 12 Logit-fixed effect result (2)

The coefficients of the regression indicate how much the factors in the model affect the issuance of international sovereign bond overtime.

The z-values test hypothesis that each coefficient is different from 0. To reject this, the z-value has to be close to 2 or -2. If the z-value is higher than absolute 2, we can say that the independent variable has a significant impact on the dependent variable. The higher the z-value, the higher the relevance of the variables.

The p-values test the hypothesis that each coefficient is different from 0. To reject this, the p-value has to be lower than 0.05 (for a 95% confidence). If the p-value is lower than 0.05, we can say that the variable has a significant impact on the dependent variable.

Positive Effect

The definition under the positive effect is that the likelihood of a country to issue international sovereign bonds is moving in the same direction as the dependent variable. In other words, if a dependent variable increase, the dependent variable will increase as well.

For government effectiveness, if government effectiveness (Geff) increases by 1 unit, the probability that a country will issue bonds increases by 16.7% significantly. The z-value of Geff is 1.86 which is close to 2 and the p-value of Geff is 0.06 which is higher than 0.05 but lower than 0.1 which means that the effect of Geff is significant on a 90% confidence interval but not on a 95% confidence interval. Therefore, government effectiveness has a significant impact on the issuance of international sovereign bonds on 90% confidence. The result of government effectiveness (Geff) has aligned with the hypothesis proposed by this research. The sign for institutional effectiveness is expected to be “positive” as a better quality of government and institutional effectiveness can increase likelihood of a country to participate in the global bond market R. Gaston Gelos, Ratna Sahay, Guido Sandleris (2011). In addition, the higher the government effectiveness and the lower the corruption the government can be, the more investors are willing to invest in its

international sovereign bonds as they see that the government has higher creditworthiness and ability to pay off the debt. In other words, if the institutional effectiveness increases, a country tends to issue more bonds internationally.

If general final government consumption expenditure (Gcon) increases by 1 unit, the probability that a country will issue foreign bond increases by 0.4%. However, the z-value of Gcon is 0.29 which is lower than 2 and the p-value of Gcon is 0.8 which is higher than 0.05. Therefore, the general final government consumption expenditure (Gcon) variable has no significant impact on the issuance of international sovereign bonds. The result of general final government consumption expenditure (Gcon) has aligned with the hypothesis proposed by this research. The sign of fiscal flexibility and performance is expected to be “positive” as Cordoba, Pujolas and Torres (2017) have illustrated the relationship between fiscal discipline - government expenditures and revenues and defaults. The research has found that fiscal disciplines along with the level of debt have determined default decisions of the government. Therefore, the likelihood of the government to issue international sovereign bond increases when the government increases its expenditure. In other words, if general final government consumption expenditure of a country increases, the likelihood that a country will issue international sovereign bond increases by 0.4% but this effect is insignificant to the issuance.

For trade (trade), if trade (trade) increases by 1 unit, the probability that a country will issue foreign bond increases by 0.01%. The z-value is 0.08 which is not close to 2 and the p-value is 0.93 which is higher than 0.05, so trade (trade) has no significant effect on the issuance of international sovereign bonds. Moreover, the

result of trade (trade) has aligned with the hypothesis proposed by this research. The sign of global liquidity is expected to be “positive” as Arellano Cristina (2008) have shown that a country with smaller terms of trade is not likely to participate in the global bond market. As a country has less participation in the global market, a country tends not to participate in the global bond market as well. In addition, the global bond market has less or no information on the credit rating of a country, so less investors are not willing to invest in those bonds.

If GDP Growth (gdp) increases by 1 unit, the probability that a country will issue foreign bond increases by 0.7%. The z-value of gdp is 0.99 which is not closed to -2 and the p-value of gdp is 0.3 which is higher than 0.05. Therefore, GDP Growth (gdp) insignificantly affects the issuance of international sovereign bond issuance. In addition, the result of GDP Growth (gdp) has aligned with the hypothesis proposed by this research. The sign of economic structure and growth is expected to be “positive” as a country with lower GDP growth is likely not to participate much in the global bond market. As the likelihood of a country to default increases when a country is in a recession or when a country develops a low level of income as a country is likely to not repay the debt, investors do not demand to invest in bonds issued by those countries. Arellano Cristina (2008). In other words, a higher GDP growth country is more likely to participate in the global bond market as investors believe that a country with higher GDP growth is less likely to default and pay back the debt.

Negative Effect

The definition under the negative effect is that the likelihood of a country to issue international sovereign bonds is moving in the opposite direction as the dependent variable. In other words, if an independent variable increase, the dependent variable will decrease.

If broad money growth (broadmoney) improves by 1 unit, the probability that a country will issue foreign bond decreases by 0.2%. The z-value of broadmoney is -0.96 which diverges from 2 and the p-value is 0.3 which is higher than 0.05, so broad money growth (braodmoney) has no significant effect on the issuance of international sovereign bond. In addition, the result of broad money growth (broadmoney) has aligned with the hypothesis proposed by this research. The sign of monetary flexibility is expected to be “negative” as Claessens et. al (2003) has illustrated that the economies with broad financial systems, which can be measured by bank deposits and stock market capitalization, will likely issue more sovereign bonds rather than foreign currency bonds. However, foreign investor demand is certainly associated with size and amount of foreign currency bonds.

From the result above, it is indicated that there is only one factor significantly affects the likelihood of international sovereign bond issuance, government effectiveness as the z-value of this variable is close to 2 and the p-value is lower than 0.05. Therefore, it can be said that a country with a higher level of government effectiveness tends to issue more international sovereign bonds.

In other words, a country with a higher level of institutional effectiveness will likely increase its sovereign bond issuance internationally. We can see that the

likelihood of developing countries to issue more sovereign bonds internationally will increase when they have higher quality of public services provided by the government, higher quality of regulation and lower corruption.

From the result above, we can see that the result has matched with the studies illustrated in the Literature review section. Claessens et. al (2003), Burger and Warnock (2006), R. Gaston Gelos, Ratna Sahay, Guido Sandleris (2011), Presbitero, Ghura, Adedeji (2016) and Chamon and Hausmann (2005) have found that a country with higher quality of government and more creditor-friendly policies and laws tends to attract more foreign investors to participate in its bond market. Therefore, a better government effectiveness country will be likely to issue more international sovereign bonds. In other words, a country with higher quality of government tends to issue more bonds internationally - government debt issued in foreign currency. To sum up, the likelihood of international bond issuance increases when a country has developed stable government effectiveness. Nevertheless, unlike Grigorian, D. A (2003) has found, this paper has also shown that real GDP growth has a significant impact on the likelihood of international bond issuance by a country.

In addition, the result from the logit-fixed effect model which is applied in this research has aligned with the result proposed by this research as well. This research has proposed that the signs of institution effectiveness, economic structure and growth, fiscal flexibility and global liquidity are expected to be “positive” whereas the sign of monetary flexibility proposed by this research is expected to be “negative”.

5.2. Comparison of the results from OLS model, logit-random effect model and logit-fixed effect model

Moreover, this research has applied the OLS regression as well as the logit-random effect regression to see how the independent variables affect the dependent variable as well as to check that the logit-fixed effect regression is better to be applied in this research in order see which factors determine the international sovereign bond issuance of developing countries.

The table below has indicated the results of OLS regression, logit-random effect regression and logit-fixed effect regression on how the independent variables - government effectiveness (Geff), general government final consumption expenditure (Gcon), broad money growth (broadmoney), trade (trade) and GDP growth (gdp) affect the dependent variable - the likelihood of developing countries to issue international sovereign bond.

	OLS	Logit-Random Effect	Logit-Fixed Effect
Geff	0.204	1.02	0.699
	0.034	0.23	1.76
Gcon	-0.005	-0.024	0.18
	0.004	0.037	0.29
broadmoney	-0.001	-0.008	-0.007
	0.001	0.007	-0.97
trade	-0.002	-0.008	0.001
	0.001	0.005	0.08
gdp	0.004	0.029	0.282
	0.005	0.029	0.98

Table 13 Comparison of the results from OLS model, Logit-random effect model and Logit-fixed effect model

From the table above, we can see that the sign from OLS regression and logit-random effect regression are different from logit-fixed effect regression in three variables – general government final consumption expenditure (Gcon), and trade (trade).

Like logit-fixed effect regression, OLS regression and logit-random effect regression have indicated the similar result on government effectiveness (Geff) and trade (trade). government effectiveness (Geff) has a positive effect on international sovereign bond issuance of developing countries in all three regressions which follow the result this research has found in the Literature Review section. In the Literature Review section, Claessens et. al (2003), Burger and Warnock (2006), R. Gaston Gelos, Ratna Sahay, Guido Sandleris (2011), Presbitero, Ghura, Adedeji (2016) and Chamon and Hausmann (2005) have found that a country tends to issue international sovereign bonds when there is higher quality of government effectiveness. Therefore, we can see that the relationship between government effectiveness (Geff) and international sovereign bond issuance of developing countries which are indicated in OLS regression and logit-random effect regression have aligned with the literature review section as well as logit-fixed effect regression. Moreover, the results in three regressions have matched with the hypothesis proposed by this research. In the conceptual framework section, the sign for institutional effectiveness is expected to be “positive” as a better quality of government and institutional effectiveness can increase likelihood of a country to participate in the global bond market. The higher the government effectiveness and the lower the corruption the government is, the more investors are willing to participate and invest in international sovereign bonds issued by that country. However, even though the signs of the results indicated by

logit-random effect regression and OLS regression are similar to the sign of the result from logit-fixed effect regression, the size of the results are different. The size of government effectiveness (Geff) from logit-fixed effect regression is 0.699 while that of OLS regression is 0.204 and that of logit-random effect regression is 1.02.

Secondly, for broad money growth (broadmoney), OLS regression and logit-random effect have also indicated the similar results to logit-fixed effect regression. The results from OLS regression and logit-random effect regression have shown that broad money growth has a negative effect on international sovereign bond issuance of developing countries. The result from OLS regression and the logit-random effect regression are like the result indicated by Claessens et. al (2003) that for international sovereign bond issuance, a country is likely to issue more international sovereign bonds when there is lower money growth. In addition, the results shown by OLS regression and logit-random effect regression match with the hypothesis proposed by this research like the result indicated by logit-fixed effect regression. The sign of monetary flexibility is expected to be “negative” as Claessens et. al (2003) has illustrated that the economies with broad financial systems, which can be measured by bank deposits and stock market capitalization, will likely issue more sovereign bonds rather than foreign currency bonds. However, foreign investor demand is certainly associated with size and amount of foreign currency bonds. Moreover, like government effectiveness (Geff) that the size of the results is different. The size of broad money growth (broadmoney) from logit-fixed effect regression is -0.007 while that of OLS regression is -0.001 and that of logit-random effect regression is -0.008.

Lastly, the similar results have been illustrated for GDP Growth (gdp) as the results for government effectiveness (Geff) and broad money growth (broadmoney). OLS regression and logit-random effect have indicated the similar results for GDP Growth (gdp) as the result shown by logit-fixed effect regression. All three regressions have shown that GDP Growth (gdp) has a positive impact on international sovereign bond issuance of developing countries. The results in three regressions have aligned with the hypothesis proposed by this research. The sign of economic structure and growth is expected to be “positive” as a country with lower GDP growth is likely not to participate much in the global bond market. As the likelihood of a country to default increases when a country is in a recession or when a country develops a low level of income as a country is likely to not repay the debt, investors do not demand to invest in bonds issued by those countries. Arellano Cristina (2008) Therefore, a country with higher GDP Growth is likely to issue international sovereign bonds as there are more investors who are willing to invest in those bonds issued by a country. Like government effectiveness (Geff) and broad money growth (broadmoney), even though the signs of the results indicated by logit-random effect regression and OLS regression are similar to the sign of the result from logit-fixed effect regression, the size of the results are different. The size of GDP Growth (gdp) from logit-fixed effect regression is 0.282 while that of OLS regression is 0.004 and that of logit-random effect regression is 0.029.

Unlike Geff, broadmoney and gdp, the OLS regression and logit-random effect regression have indicated the different relationship for Gcon and trade on international sovereign bond issuance.

For general government final consumption expenditure (Gcon), the OLS regression and the logit-random effect regression have indicated that general government final consumption expenditure (Gcon) has a negative effect on international sovereign bond issuance of developing countries while the result shown by logit-fixed effect regression is positive. In other words, the results indicated by the OLS regression and the logit-random effect regression have indicated that when a country has a lower level of government spending, the likelihood of international sovereign bonds increases which violate the result we have found in both the Literature Review section and the result from this research. David A. Grigorian (2003) and Presbitero, Ghura, Adedeji (2016) have illustrated that a country is likely to issue international bonds when an expansionary fiscal policy has been conducted. In addition, not only the results indicated by the OLS regression and the logit-random effect regression have violated the findings from the Literature Review section and the result from logit-fixed effect regression shown in this research, but also not aligned with the hypothesis proposed by this research. In the Conceptual Framework section, the sign of fiscal flexibility and performance is expected to be “positive”. As Cordoba, Pujolas and Torres (2017) have determined the relationship between fiscal discipline - government expenditures and revenues and defaults and the result has shown that fiscal disciplines along with the level of debt have determined default decisions of the government, when the government increases its expenditure, the government is likely to issue more international bonds. Moreover, not only the signs of the results indicated by logit-random effect regression and OLS regression are different to the sign of the result from logit-fixed effect regression, the size of the results is also different. The size of general government final consumption

expenditure (Gcon) from logit-fixed effect regression is 0.18 while that of OLS regression is -0.005 and that of logit-random effect regression is -0.024.

Lastly, for trade (trade), the result indicated by OLS regression and logit-random effect regression are different from logit-fixed effect regression. The result from OLS regression and logit-random effect regression have shown that trade has a negative effect on international sovereign bond issuance of developing countries. In other words, when a country with lower trade is likely to participate much in the global bond market. However, the result from logit-random effect regression is aligned with the hypothesis proposed by this research. In the Conceptual Framework section, the sign of global liquidity is expected to be “positive” as Arellano Cristina (2008) have shown that a country with smaller terms of trade is not likely to participate in the global bond market. As a country has less participation in the Global market, a country tends not to participate in the global bond market as well. In addition, global bond market has less or no information on the credit rating of a country, so less investors are not willing to invest in those bonds. Nevertheless, the result from logit-random effect does not align with the result from logit-fixed effect regression in this research whereas the result from OLS regression does. Moreover, like general government final consumption expenditure (Gcon), not only the signs of the results indicated by logit-random effect regression is different to the sign of the result from logit-fixed effect regression, the size of the results is also different. The size of trade (trade) from logit-fixed effect regression is 0.001 while that of logit-random effect regression is -0.008 and the size of trade (trade) from OLS regression is also different from that of logit-fixed effect regression as well which is -0.002.

Furthermore, from the table above we can indicate that the OLS regression and the logit-random effect regression are not applicable for indicating the likelihood of international sovereign bond issuance as logit-fixed effect regression is. We can see that not only the sign of the results from OLS regression and logit-random effect regression is different but the size of the results of all variables from OLS regression and logit-random effect regression is also different from the result from logit-fixed effect regression as well. As there can be some issues such as a heterogeneity problem, unmeasurable control variables problem and endogeneity problem which logit-fixed effect model can clear out. Therefore, we can be assured that the logit-fixed effect model is more capable to indicate the factors affecting the likelihood of international sovereign bond issuance in this research.

5.2.1. Hausman Test

Hausman is a general implementation of Hausman's (1978) specification test, which compares between an estimator θ_1 and an estimator. The estimation θ_1 is said to be consistent while the estimator θ_2 is efficient under the assumption being tested. The null hypothesis is that the estimator θ_2 is indeed an efficient (and consistent) estimator of the true parameters.

To determine whether fixed or random effect is appropriated for the test, we can run a Hausman test, where the null hypothesis is logit-random effect model which is preferable to the model while the alternative is logit-fixed effect model.

Null hypothesis: Logit-random effect model is appropriated

Alternative hypothesis: Logit-fixed effect model is appropriated

```

                b = consistent under Ho and Ha; obtained from xtlogit
                B = inconsistent under Ha, efficient under Ho; obtained from xtlogit

Test:  Ho:  difference in coefficients not systematic

        chi2(5) = (b-B)' [(V_b-V_B)^(-1)] (b-B)
                =      27.81
        Prob>chi2 =      0.0000

```

Figure 6 Hausman test result

Under the current specification, the null hypothesis which is logit-random effect model is appropriated is rejected as Prob>chi2 is lower than 0.05. Therefore, the Hausman test has shown that logit-fixed effect model is preferred to determine factors affecting international sovereign bond issuance.

5.3. Sub-sample analysis between low-income and high-income countries

This research has conducted the sub-sample analyses on two different groups of developing countries. One is High-income countries, and another is Low-income countries. The income level can be analyzed by the average GDP of each Developing country. The result has divided develop countries into two groups - 18 High-income developing countries and 18 Low-income developing countries.

5.3.1. High-Income country

Logit Model, Fixed Effect ; High-Income Country, n=9/18			
	Coef	z	p value
Geff	-0.016	-0.2	0.841
Gcon	0.0004	0.62	0.537
broadmoney	-0.0002	-0.07	0.945
trade	0.003	0.03	0.407
gdp	0.001	0.16	0.877

Table 14 Logit-fixed effect result for high income countries

From the table above, the results can be indicated as following:

Positive Effect

There are three variables that have a positive impact on the likelihood of international sovereign bond issuance of High-Income developing countries - general government final consumption expenditure (Gcon), trade (trade) and GDP Growth (gdp).

If general government final consumption expenditure (Gcon) increases by 1 unit, the likelihood of international sovereign bond issuance of High-Income developing countries tends to increase by 0.04%. The result has also matched with the hypothesis proposed by this research that the sign of fiscal flexibility and performance is expected to be positive. The result has shown that Gcon has an insignificant impact on international sovereign bond issuance of High-income countries as the z value is 0.62 which diverges from 2 and the p-value is 0.537 which is higher than 0.05.

If trade (trade) increases by 1 unit, the likelihood of international sovereign bond issuance of High-Income developing countries tends to increase by 0.3%. The result has also matched with the hypothesis proposed by this research that the sign of global liquidity is expected to be positive. The result has shown that trade has an insignificant impact on international sovereign bond issuance of High-income countries as the z value is 0.03 which diverges from 2 and the p-value is 0.407 which is higher than 0.05.

If GDP Growth (gdp) increases by 1 unit, the likelihood of international sovereign bond issuance of High-Income developing countries tends to increase by 0.1%. The result has also matched with the hypothesis proposed by this research that the sign of economic structure and growth is expected to be positive. The result has shown that gdp has an insignificant impact on international sovereign bond issuance of High-income countries as the z value is 0.16 which diverges from 2 and the p-value is 0.877 which is higher than 0.05.

Negative Effect

There are two variables that have a negative impact on the likelihood of international sovereign bond issuance of High-Income developing countries - government effectiveness (Geff) and broad money growth (broadmoney).

If broad money growth (broadmoney) increases by 1 unit, the likelihood of international sovereign bond issuance of High-Income developing countries tends to decrease by 0.02%. The result has also matched with the hypothesis proposed by this research that the sign of monetary flexibility is expected to be negative. The result has shown that broadmoney has an insignificant impact on international sovereign bond issuance of High-income countries as the z value is -0.07 which diverges from -2 and the p-value is 0.945 which is higher than 0.05.

If government effectiveness (Geff) increases by 1 unit, the likelihood of international sovereign bond issuance of High-Income developing countries tends to decrease by 1.6%. However, the result has not matched with the hypothesis proposed by this research that the sign of institutional effectiveness is expected to be negative as well as the result from the logit-fixed effect model for developing countries. The result has shown that Geff has an insignificant impact on international sovereign bond issuance of High-income countries as the z value is -0.2 which diverges from -2 and the p-value is 0.841 which is higher than 0.05.

To sum up, the result of High-income countries from logit-fixed effect regression has indicated that general government final consumption expenditure (Gcon), trade (trade) and GDP Growth (gdp) have a positive effect on international sovereign bond issuance of High-income developing countries. The result has also

matched with the hypothesis proposed by this research as well as the result of logit-fixed effect regression on developing countries that the sign of general government final consumption expenditure (Gcon), trade (trade) and GDP Growth (gdp) are positive towards international sovereign bond issuance of developing countries. On the other hand, the result has shown that broad money growth (broadmoney) has a negative impact on international sovereign bond issuance of High-income developing countries. The sign of broad money growth (broadmoney) has also matched with the hypothesis proposed by this research as well.

On the other hand, the result of logit-fixed effect regression on High-income countries has shown that government effectiveness (Geff) has a negative effect on international sovereign bond issuance of High-income developing countries which violates the hypothesis proposed by this research.

In conclusion, the sub-sample analysis on High-income developing countries does not align with the hypothesis proposed by this research as well as the result of logit-fixed effect regression on developing countries as the result of government effectiveness has shown a negative effect on international sovereign bond issuance.

5.3.2. Low-Income country

Logit Model, Fixed Effect ; Low-Income Country, n=9/18			
	Coef	z	p value
Geff	0.08	0.44	0.663
Gcon	-0.002	-0.51	0.619
broadmoney	0.009	1.7	0.089
trade	-0.005	-1.35	0.176
gdp	0.005	0.48	0.63

Table 15 Logit-fixed effect result for low-income country

From the table above, the results can be indicated as following:

Positive Effect

There are three variables that have a positive impact on the likelihood of international sovereign bond issuance of High-Income developing countries - government effectiveness (Geff), broad money growth (broadmoney) and GDP Growth (gdp).

If government effectiveness (Geff) increases by 1 unit, the likelihood of international sovereign bond issuance of High-Income developing countries tends to increase by 8%. The result has also matched with the hypothesis proposed by this research that the sign of Institution Effectiveness is expected to be positive. However, the result has shown that government effectiveness (Geff) has an insignificant effect on international sovereign bond issuance of Low-income developing countries as although the z value of Geff is 1.7 which is closed to 2, the p-value is 0.09 which is higher than 0.05.

If GDP Growth (gdp) increases by 1 unit, the likelihood of international sovereign bond issuance of High-Income developing countries tends to increase by 0.5%. The result has also matched with the hypothesis proposed by this research that the sign of economic structure and growth is expected to be positive. However, the result has shown that GDP Growth (gdp) has an insignificant effect on international sovereign bond issuance of Low-income developing countries as the z value of gdp is 0.48 which diverge from 2 and the p-value is 0.63 which is higher than 0.05.

If broad money growth (broadmoney) increases by 1 unit, the likelihood of international sovereign bond issuance of High-Income developing countries tends to increase by 0.9%. However, the result has not matched with the hypothesis proposed by this research that the sign of monetary flexibility is expected to be negative as well as the result from the logit-fixed effect model for developing countries. In addition, the result has shown that broad money growth (broadmoney) has an insignificant effect on international sovereign bond issuance of Low-income developing countries as the z value of broadmoney is -0.51 which diverge from -2 and the p-value is 0.619 which is higher than 0.05.

Negative Effect

There are two variables that have a negative impact on the likelihood of international sovereign bond issuance of High-Income developing countries - general government final consumption expenditure (Gcon) and trade (trade).

If general government final consumption expenditure (Gcon) increases by 1 unit, the likelihood of international sovereign bond issuance of High-Income developing countries tends to decrease by 0.2%. Nevertheless, the result has not matched with the hypothesis proposed by this research that the sign of fiscal flexibility and performance is expected to be positive as well as the result from the logit-fixed effect model for developing countries. In addition, the result has shown that general government final consumption expenditure (Gcon) has an insignificant effect on international sovereign bond issuance of Low-income developing countries as the z value of Gcon is -0.51 which diverge from -2 and the p-value is 0.619 which is higher than 0.05.

If trade (trade) increases by 1 unit, the likelihood of international sovereign bond issuance of High-Income developing countries tends to decrease by 0.5%. However, the result has not matched with the hypothesis proposed by this research that the sign of global liquidity is expected to be negative as well as the result from the logit-fixed effect model for developing countries. In addition, the result has shown that trade (trade) has an insignificant effect on international sovereign bond issuance of Low-income developing countries as the z value of trade is -1.35 which diverge from 2 and the p-value is 0.176 which is higher than 0.05.

To sum up, the result of logit-fixed effect regression on the sub-sample analysis of Low-income developing countries has shown that there are three factors that have a positive effect on international sovereign bond issuance of Low-income countries - government effectiveness (Geff), broad money growth (broadmoney) and GDP Growth (gdp). However, only two factors which are government effectiveness

(Geff) and GDP Growth (gdp) that the result has aligned with the hypothesis proposed by this research as well as the result from logit-fixed effect regression while the result of Broad Money Growth (broadmoney) has violated the hypothesis proposed by this research as well as the result from logit-fixed effect regression of developing countries.

On top of that, the result of logit-fixed effect regression on the sub-sample analysis of Low-income developing countries has shown that there are two factors that have a negative effect on international sovereign bond issuance of Low-income countries - general government final consumption expenditure (Gcon) and trade (trade). The result has also violated the hypothesis proposed by this research and the result from logit-fixed effect regression as well.

From both of the sub-sample analyses which has been conducted in this research, the results have illustrated that both sub-sample analyses are not reliable as there are signs of some factors that do not align with the hypothesis proposed by this research and the result from logit-fixed effect regression on developing countries as well as the information which are obtained from the literature review section. The reasons under the unreliable result of sub-sample analyses on High-income developing countries and Low-income developing countries can be studied further. Therefore, the research suggests that there should be more further studies on sub-sample analyses as well as the data measurement.

6. Conclusion

Over the past decade, many countries, especially developing countries, have experienced budget deficits as they are hit by crises while trying to improve infrastructure as well as the overall standard of living of citizens. To gather finance for a country, there are various ways for the government to proceed. A common way is by taxation where the government collects revenue from its citizens. However, there are some limitations to taxation. For example, especially for a developing country, the tax base is usually shallow and moreover determining the optimal tax rate may be tricky. Another way to finance a country's expenditure is to borrow money from other financial institutions and/or other countries. However, financial institutions such as the IMF or other development banks often impose specific conditions which can seriously constrain the borrowing country's sovereignty and control. Not unlike borrowing from financial institutions, borrowing from other countries also often requires the borrowing country to abide to specific conditions as well as to follow the general guidelines of the lender countries. Alternatively, issuing bonds both domestically and internationally may be preferred to as a means for a country to finance its budget. The global financial market, especially the global bond market, has seen considerable growth over the past decades. The Bank of International Settlements, for example, states that the global bond market has grown from 24,557 billion USD in 4Q2018 to 25,196 billion USD at the end of 2019. Moreover, considering international sovereign bond issued by developed countries and those by developing countries, Debt Securities Statistics from the Bank of Settlements indicates that the general government of emerging markets and developing economies

issued 1,242 billion USD of international debt securities while developed countries have issued only 630 billion USD in 2019. In addition, in comparison to the domestic bond market, developing countries are likely to issue bonds in a foreign market rather than issuing bonds in their local bond market.

In this thesis, based on the S&P Global Ratings (2014), we consider whether four main internal factors and one external factor have an impact on a country's bond issuance i.e. institutional effectiveness, fiscal flexibility and performance, economic structure and growth, monetary flexibility and global liquidity. Using data of international sovereign bond issuance across developing countries in ASEAN, Eastern Europe, Latin America and Sub-Saharan Africa region issued between 1996 – 2016, we determine using the logit-fixed effect model whether the five determinants of international sovereign bond issuance of developing countries are valid.

More specifically, the logit-fixed effect model is used to determine which factors affect the issuance of international sovereign bonds in ASEAN, Eastern Europe, Latin America and Sub-Saharan Africa. Fixed effects explain the relationship between independent and dependent variables within an entity. Each entity has its own individual characteristics that may influence the independent variables. Fixed effects have been applied when an individual is assumed to influence other variables. By using fixed effects, control variables will not be captured as in the Fixed effect model, control variables will cancel each other out.

The result show that government effectiveness (Geff) and GDP growth (gdp) of developing country is related to the issue of international sovereign bonds and is significantly significant. That is, a country with a higher level of institutional

effectiveness will likely to increase its sovereign bond issuance internationally. We can see that the likelihood of developing countries to issue more sovereign bonds internationally will increase when they have higher quality of public services provided by the government, higher quality of regulation and lower corruption. The result has also matched with the studies illustrated in the Literature review section. Claessens et. al (2003), Burger and Warnock (2006), R. Gaston Gelos, Ratna Sahay, Guido Sandleris (2011), Presbitero, Ghura, Adedeji (2016) and Chamon and Hausmann (2005) have found that a country with higher quality of government and more creditor-friendly policies and laws tends to attract more foreign investors to participate in its bond market.

Although statistically significant, the other factors positively related to international sovereign bond issuance of developing countries are fiscal flexibility and performance and global liquidity. However, there is one factor affecting international sovereign bond issuance of developing countries negatively which is monetary flexibility.

To sum up, the likelihood of international sovereign bond issuance of developing countries for our sample countries is related to stable government effectiveness. In addition, institution effectiveness, economic structure and growth, fiscal flexibility and global liquidity are also important, whereas monetary flexibility has a “negative” sign.

7. Appendix

```
. xtlogit Issue Geff Gcon broadmoney trade gdp, fe
note: multiple positive outcomes within groups encountered.
note: 2 groups (19 obs) dropped because of all positive or
      all negative outcomes.

Iteration 0:  log likelihood = -272.75875
Iteration 1:  log likelihood = -271.26423
Iteration 2:  log likelihood = -271.26389
Iteration 3:  log likelihood = -271.26389

Conditional fixed-effects logistic regression   Number of obs   =       672
Group variable: iso3                          Number of groups =        33

Obs per group:
      min =          13
      avg =         20.4
      max =          21

LR chi2(5)      =          5.31
Prob > chi2     =          0.3790

Log likelihood = -271.26389
```

Issue	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Geff	.6987921	.396693	1.76	0.078	-.078712	1.476296
Gcon	.0177319	.0614534	0.29	0.773	-.1027145	.1381783
broadmoney	-.0071746	.0073866	-0.97	0.331	-.021652	.0073028
trade	.0006844	.008455	0.08	0.935	-.0158872	.017256
gdp	.0282256	.0288684	0.98	0.328	-.0283555	.0848068

```
. margins, dydx(*)
```

```
Average marginal effects   Number of obs   =       672
Model VCE      : OIM

Expression      : Pr(Issue|fixed effect is 0), predict(pu0)
dy/dx w.r.t.   : Geff Gcon broadmoney trade gdp
```

	Delta-method				[95% Conf. Interval]	
	dy/dx	Std. Err.	z	P> z		
Geff	.167321	.0898676	1.86	0.063	-.0088164	.3434583
Gcon	.0042458	.0144362	0.29	0.769	-.0240486	.0325402
broadmoney	-.0017179	.0017909	-0.96	0.337	-.005228	.0017922
trade	.0001639	.0020184	0.08	0.935	-.003792	.0041198
gdp	.0067584	.0068237	0.99	0.322	-.0066158	.0201327

Figure 7 Result for logit-fixed effect regression from Stata

```

Random-effects logistic regression      Number of obs      =      691
Group variable: iso3                  Number of groups   =      35

Random effects u_i ~ Gaussian         Obs per group:
                                      min =           7
                                      avg =          19.7
                                      max =          21

Integration method: mvaghermite       Integration pts.   =      12

Log likelihood = -360.1002             Wald chi2(5)      =      16.82
                                      Prob > chi2       =      0.0048

```

Issue	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Geff	1.020297	.2996764	3.40	0.001	.4329416	1.607652
Gcon	-.0238151	.0367165	-0.65	0.517	-.0957781	.048148
broadmoney	-.0077393	.0069159	-1.12	0.263	-.0212941	.0058155
trade	-.0082738	.0051804	-1.60	0.110	-.0184272	.0018796
gdp	.0289506	.0285555	1.01	0.311	-.0270172	.0849184
_cons	.0639059	.7059237	0.09	0.928	-1.319679	1.447491
/lnsig2u	-.1059954	.3603635			-.812295	.6003041
sigma_u	.9483822	.1708812			.6662119	1.350064
rho	.2146968	.060758			.1188734	.3565102

```
. margins, dydx(*)
```

```

Average marginal effects              Number of obs      =      691
Model VCE      : OIM

```

```

Expression      : Linear prediction, predict()
dy/dx w.r.t.   : Geff Gcon broadmoney trade gdp

```

	Delta-method					
	dy/dx	Std. Err.	z	P> z	[95% Conf. Interval]	
Geff	1.020297	.2996764	3.40	0.001	.4329416	1.607652
Gcon	-.0238151	.0367165	-0.65	0.517	-.0957781	.048148
broadmoney	-.0077393	.0069159	-1.12	0.263	-.0212941	.0058155
trade	-.0082738	.0051804	-1.60	0.110	-.0184272	.0018796
gdp	.0289506	.0285555	1.01	0.311	-.0270172	.0849184

Figure 8 Result for logit-random effect regression from Stata

```
. regress Issue Geff Gcon broadmoney trade gdp
```

Source	SS	df	MS	Number of obs	=	691
Model	11.3294208	5	2.26588416	F(5, 685)	=	11.91
Residual	130.360883	685	.190307859	Prob > F	=	0.0000
Total	141.690304	690	.205348267	R-squared	=	0.0800
				Adj R-squared	=	0.0732
				Root MSE	=	.43624

Issue	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Geff	.204171	.0337149	6.06	0.000	.1379742	.2703679
Gcon	-.0054825	.0037678	-1.46	0.146	-.0128803	.0019153
broadmoney	-.0014646	.0009872	-1.48	0.138	-.003403	.0004738
trade	-.0018739	.0005266	-3.56	0.000	-.0029078	-.0008399
gdp	.0042325	.0046984	0.90	0.368	-.0049926	.0134575
_cons	.5702873	.0721937	7.90	0.000	.4285398	.7120349

Figure 9 Result for OLS regression from Stata



```

. xtlogit Issue Geff Gdebt boardmoney trade gdp, fe
note: multiple positive outcomes within groups encountered.

Iteration 0:   log likelihood = -49.664594
Iteration 1:   log likelihood = -46.088433
Iteration 2:   log likelihood = -46.06892
Iteration 3:   log likelihood = -46.068919

Conditional fixed-effects logistic regression   Number of obs   =       102
Group variable: iso3                           Number of groups =        8

Obs per group:
      min =        6
      avg =       12.8
      max =       19

LR chi2(5)   =        4.01
Prob > chi2  =       0.5485

Log likelihood = -46.068919

```

Issue	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
Geff	-.2184479	1.094991	-0.20	0.842	-2.364591 1.927695
Gdebt	.0064005	.0064361	0.99	0.320	-.0062141 .019015
boardmoney	-.0025982	.0348013	-0.07	0.940	-.0708075 .065611
trade	.0369809	.0213842	1.73	0.084	-.0049314 .0788933
gdp	.0139171	.0892459	0.16	0.876	-.1610017 .1888359

```

. margins, dydx(*)

```

```

Average marginal effects   Number of obs   =       102
Model VCE      : OIM

Expression   : Pr(Issue|fixed effect is 0), predict(pu0)
dy/dx w.r.t. : Geff Gdebt boardmoney trade gdp

```

	Delta-method				
	dy/dx	Std. Err.	z	P> z	[95% Conf. Interval]
Geff	-.0161284	.0802254	-0.20	0.841	-.1733672 .1411104
Gdebt	.0004726	.000765	0.62	0.537	-.0010269 .001972
boardmoney	-.0001918	.00278	-0.07	0.945	-.0056406 .0052569
trade	.0027304	.0032912	0.83	0.407	-.0037202 .0091809
gdp	.0010275	.0066153	0.16	0.877	-.0119382 .0139933

Figure 10 Result of sub-sample analysis on High-income developing countries

```

. use Issuelow.dta

. xtlogit Issue Geff Gdebt boardmoney trade gdp, fe
note: multiple positive outcomes within groups encountered.
note: 2 groups (4 obs) dropped because of all positive or
      all negative outcomes.

Iteration 0:  log likelihood = -26.265575
Iteration 1:  log likelihood = -23.935147
Iteration 2:  log likelihood = -23.85533
Iteration 3:  log likelihood = -23.854286
Iteration 4:  log likelihood = -23.854286

Conditional fixed-effects logistic regression      Number of obs   =       86
Group variable: iso3                             Number of groups =        9

Obs per group:
      min =        3
      avg =       9.6
      max =       20

LR chi2(5) =       14.60
Prob > chi2 =       0.0122

Log likelihood = -23.854286

```

Issue	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Geff	.3445289	1.529065	0.23	0.822	-2.652384	3.341441
Gdebt	-.0561192	.0481055	-1.17	0.243	-.1504042	.0381659
boardmoney	.0844526	.0474532	1.78	0.075	-.0085539	.1774592
trade	-.0904997	.0414085	-2.19	0.029	-.1716589	-.0093405
gdp	-.1039051	.1140367	-0.91	0.362	-.327413	.1196028

```
. margins, dydx(*)
```

```

Average marginal effects      Number of obs   =       76
Model VCE      : OIM

Expression      : Pr(Issue|fixed effect is 0), predict(pu0)
dy/dx w.r.t.   : Geff Gdebt boardmoney trade gdp

```

	Delta-method					
	dy/dx	Std. Err.	z	P> z	[95% Conf. Interval]	
Geff	.080409	.1843623	0.44	0.663	-.2809344	.4417525
Gdebt	-.0021239	.0041992	-0.51	0.613	-.0103543	.0061065
boardmoney	.0085198	.0050146	1.70	0.089	-.0013086	.0183481
trade	-.0047231	.0034909	-1.35	0.176	-.0115651	.0021189
gdp	.0049223	.0102194	0.48	0.630	-.0151074	.0249519

Figure 11 Result of sub-sample analysis on Low-income developing countries

8. References

- Acemoglu, Daron, and Simon Johnson. “Unbundling Institutions.” *National Bureau of Economic Research*, 2003, pp. 949–995., doi:10.3386/w9934.
- Adelegan, Olatundun Janet, and Bozena Radzewicz-Bak. “What Determines Bond Market Development in Sub-Saharan Africa?” *IMF Working Papers*, vol. 09, no. 213, 2009, p. 1., doi:10.5089/9781451873603.001.
- Arellano, Cristina. “Default Risk and Income Fluctuations in Emerging Economies.” *American Economic Review*, vol. 98, no. 3, 2008, pp. 690–712., doi:10.1257/aer.98.3.690.
- Asian, Development Bank. “ADB Annual Report 2002.” *ADB Annual Reports*, 2002.
- Bhattacharyay, Biswa Nath. “Determinants of Bond Market Development in Asia.” *Journal of Asian Economics*, vol. 24, 2013, pp. 124–137., doi:10.1016/j.asieco.2012.11.002.
- Bird, Graham. “IMF Lending to Developing Countries.” 2003, doi:10.4324/9780203392584.
- Broner, Fernando, et al. “Why Do Emerging Economies Borrow Short Term?” *Policy Research Working Papers*, 2004, doi:10.1596/1813-9450-3389.
- Burger, John, and Francis Warnock. “Foreign Participation in Local Currency Bond Markets.” *International Finance Discussion Papers*, vol. 794, 2004, doi:10.3386/w12548.
- Chamon, Marcos, and Ricardo Hausmann. “Why Do Countries Borrow the Way They Borrow?” *Other People's Money*, 2004, pp. 218–232., doi:10.7208/chicago/9780226194578.003.0009.

- Chen, Hsien-Yi, and Sheng-Syan Chen. "Quality of Government Institutions and Spreads on Sovereign Credit Default Swaps." *Journal of International Money and Finance*, vol. 87, 2018, pp. 82–95., doi:10.1016/j.jimonfin.2018.05.008.
- Claessens, Stijn, et al. "Government Bonds in Domestic and Foreign Currency: The Role of Macroeconomic and Institutional Factors." *Policy Research Working Papers*, 2003, doi:10.1596/1813-9450-2986.
- De-Córdoba, Gonzalo F., et al. "Fiscal Discipline and Defaults." *Review of Economic Dynamics*, vol. 24, 2017, pp. 1–13., doi:10.1016/j.red.2016.12.001.
- Dowd, Kevin, and Barry Eichengreen. "International Monetary Arrangements for the 21st Century." *Southern Economic Journal*, vol. 62, no. 4, 1996, p. 1104., doi:10.2307/1060961.
- Eichengreen, Barry J., et al. "Original Sin: the Pain, the Mystery, and the Road to Redemption." 2002.
- Eichengreen, Barry, and Ashoka Mody. "What Explains Changing Spreads on Emerging-Market Debt: Fundamentals or Market Sentiment?" *NBER Working Paper*, vol. 6408, 1998, doi:10.3386/w6408.
- Eichengreen, Barry, and Ricardo Hausmann. "Exchange Rates and Financial Fragility." 1999, doi:10.3386/w7418.
- Eichengreen, Barry, and Ricardo Hausmann. "Other People's Money." 2005, doi:10.7208/chicago/9780226194578.001.0001.
- Fiaschi, Davide. "Growth and Inequality in an Endogenous Fiscal Policy Model with Taxes on Labor and Capital." *European Journal of Political Economy*, vol. 15, no. 4, 1999, pp. 727–746., doi:10.1016/s0176-2680(99)00038-5.
- Fitzmaurice, G.m., and N.m. Laird. "Multivariate Analysis: Discrete Variables (Logistic Regression)." *International Encyclopedia of the Social & Behavioral Sciences*, 2001, pp. 10221–10228., doi:10.1016/b0-08-043076-7/00476-9.

- Gelos, R. Gaston, et al. "Sovereign Borrowing by Developing Countries: What Determines Market Access?" *Journal of International Economics*, vol. 83, no. 2, 2011, pp. 243–254., doi:10.1016/j.jinteco.2010.11.007.
- Gelos, R. Gaston, et al. "Sovereign Borrowing by Developing Countries: What Determines Market Access?" *Journal of International Economics*, vol. 83, no. 2, 2011, pp. 243–254., doi:10.1016/j.jinteco.2010.11.007.
- Grandes, Martin, and Marcel Peter. "The Empirical Determinants of Local-Currency-Denominated Corporate Spreads in Emerging Economies: Evidence from South Africa." *OECD Development Centre Working Papers*, 2007.
- Greene, William H. *Econometric Analysis*. Pearson Education Limited, 2020.
- Grigorian, David A. "On the Determinants of First-Time Sovereign Bond Issues." *IMF Working Papers*, vol. 03, no. 184, 2003, p. 1., doi:10.5089/9781451859386.001.
- Guillon, Marlène, and Jacky Mathonnat. "What Can We Learn on Chinese Aid Allocation Motivations from Available Data? A Sectorial Analysis of Chinese Aid to African Countries." *China Economic Review*, vol. 60, 2020, p. 101265., doi:10.1016/j.chieco.2019.01.004.
- Gujarati, Damodar. "Econometrics." 2014, doi:10.1007/978-1-137-37502-5.
- Gurara, Daniel, et al. "Borrowing Costs and The Role of Multilateral Development Banks." *IMF Working Papers*, vol. 18, no. 263, 2018, p. 1., doi:10.5089/9781484386200.001.
- Hagen, Rune Jansen. "Basic Analytics of Multilateral Lending and Surveillance." *Journal of International Economics*, vol. 79, no. 1, 2009, pp. 126–136., doi:10.1016/j.jinteco.2009.04.007.

Hausmann, Ricardo and Roberto Rigobon, “Foreign Bias: On the Global Consequences of Country Heterogeneity and Transaction Costs” unpublished, Harvard University, 2003.

Hausmann, Ricardo, and Ugo Panizza. “On the Determinants of Original Sin: an Empirical Investigation.” *Journal of International Money and Finance*, vol. 22, no. 7, 2003, pp. 957–990., doi:10.1016/j.jimonfin.2003.09.006.

Hausmann, Ricardo, et al. “Financial Turmoil and Choice of Exchange Rate Regime.” *SSRN Electronic Journal*, 1999, doi:10.2139/ssrn.1817197.

Hausmann, Ricardo, et al. “Why Do Countries Float the Way They Float?” *Journal of Development Economics*, vol. 66, 2000, pp. 387–414., doi:10.2139/ssrn.1817216.

Ireland, Peter N. “Supply-Side Economics and Endogenous Growth.” *Journal of Monetary Economics*, vol. 33, no. 3, 1994, pp. 559–571., doi:10.1016/0304-3932(94)90043-4.

Jeanneret, Alexandre. “Sovereign Credit Spreads under Good/Bad Governance.” *Journal of Banking & Finance*, vol. 93, 2018, pp. 230–246., doi:10.1016/j.jbankfin.2018.04.005.

Jorra, Markus. “The Effect of IMF Lending on the Probability of Sovereign Debt Crises.” *Journal of International Money and Finance*, vol. 31, no. 4, 2012, pp. 709–725., doi:10.1016/j.jimonfin.2012.01.010.

Kim, Se-Jik. “Growth Effect of Taxes in an Endogenous Growth Model: to What Extent Do Taxes Affect Economic Growth?” *Journal of Economic Dynamics and Control*, vol. 23, no. 1, 1998, pp. 125–158., doi:10.1016/s0165-1889(97)00111-5.

- Lin, Boqiang, and Zhijie Jia. "Tax Rate, Government Revenue and Economic Performance: A Perspective of Laffer Curve." *China Economic Review*, vol. 56, 2019, p. 101307., doi:10.1016/j.chieco.2019.101307.
- Longstaff, Francis, et al. "How Sovereign Is Sovereign Credit Risk?" *American Economic Journal: Macroeconomics*, 2011, pp. 75–103., doi:10.3386/w13658.
- Maitra, Biswajit. "Macroeconomic Impact of Public Debt and Foreign Aid in Sri Lanka." *Journal of Policy Modeling*, vol. 41, no. 2, 2019, pp. 372–394., doi:10.1016/j.jpolmod.2019.03.002.
- Malovaná, Simona, et al. "Does Monetary Policy Influence Banks' Risk Weights under the Internal Ratings-Based Approach?" *Economic Systems*, vol. 43, no. 2, 2019, p. 100689., doi:10.1016/j.ecosys.2018.10.003.
- Marchesi, Silvia, and Laura Sabani. "Imf Concern for Reputation and Conditional Lending Failure: Theory and Empirics." *SSRN Electronic Journal*, 2005, doi:10.2139/ssrn.876559.
- Mcbrady, Matthew R., and Michael J. Schill. "Foreign Currency Denominated Borrowing in the Absence of Operating Incentives." *Journal of Financial Economics*, vol. 86, no. 1, Oct. 2007, pp. 145–177., doi:10.2139/ssrn.925864.
- Mendoza, Enrique, and Vivian Yue. "A General Equilibrium Model of Sovereign Default and Business Cycles." *The Quarterly Journal of Economics*, vol. 127, no. 2, 2011, doi:10.3386/w17151.
- Momita, Yasuaki, et al. "Has ODA Contributed to Growth? An Assessment of the Impact of Japanese ODA." *Japan and the World Economy*, vol. 49, 2019, pp. 161–175., doi:10.1016/j.japwor.2018.11.002.
- Muinelo-Gallo, Leonel, and Oriol Roca-Sagalés. "Joint Determinants of Fiscal Policy, Income Inequality and Economic Growth." *Economic Modelling*, vol. 30, 2013, pp. 814–824., doi:10.1016/j.econmod.2012.11.009.

- Nemlioglu, Ilayda, and Sushanta Mallick. “Does Multilateral Lending Aid Capital Accumulation? Role of Intellectual Capital and Institutional Quality.” *Journal of International Money and Finance*, vol. 108, 2020, p. 102155., doi:10.1016/j.jimonfin.2020.102155.
- OECD. “Foreign Direct Investment and Recovery in Southeast Asia.” 1999, doi:10.1787/9789264174207-en.
- Patnaik, and Sharma. “Selection Problems for Application of Probit, Tobit, Logit & Maximum Likelihood Estimation: A Methodological Issue.” *International Journal of Computational Engineering Research*, vol. 3, no. 7, 2013.
- Peristian, Stavros, and João A. C. Santos. “Has the US Bond Market Lost Its Edge to the Eurobond Market?.” *International Review of Finance*, vol. 10, no. 2, 2008, pp. 149–183., doi:10.1111/j.1468-2443.2010.01111.x.
- Presbitero, Andrea F., et al. “Sovereign Bonds in Developing Countries: Drivers of Issuance and Spreads.” *Review of Development Finance*, vol. 6, no. 1, 2016, pp. 1–15., doi:10.1016/j.rdf.2016.05.002.
- Rao, Govinda. “Trends and Issues in Tax Policy and Reform in India.” *Brookings Papers on Economic Activity*, vol. 2, 2005, pp. 55–122.
- Robert C. Brown. "Constitutional Limitations on Progressive Taxation of Gross Income" *22 Iowa Law Review* 246 (1937), 1937
- S&P, Global Rating. “Sovereign Rating Methodology.” 2014.
- Schabert, Andreas. “Monetary Policy Under a Fiscal Theory of Sovereign Default.” *Journal of Economic Theory*, 2009, pp. 860–868., doi:10.2139/ssrn.1502589.
- Settlements, Bank For International. “The Development of Bond Markets in Emerging Economies.” *BIS Papers*, vol. 11, 2002, doi:10.2139/ssrn.1187575.

- Sokolova, Anna. “Fiscal Limits and Monetary Policy: Default vs. Inflation.” *Economic Modelling*, vol. 48, 2015, pp. 189–198., doi:10.2139/ssrn.2353341.
- Takeuchi, A. “Identifying the Impediments to Cross-Border Investment and Issuance in Asian Countries.” *BIS Papers No 30*, 2006, pp. 246–280.
- Tyson, Judith. “Sub-Saharan Africa International Sovereign Bonds.” *Overseas Development Institute*, 2015.
- Waibel, Michael. “Political Responses to Sovereign Defaults.” *Sovereign Defaults before International Courts and Tribunals*, 2019, pp. 22–41., doi:10.1017/cbo9780511974922.004.
- Yong, Yoon. “Public Bond Financing in Asia-Pacific. Final Write-up on Empirical Work.” 2017.
- Zeyneloglu, Irem. “Fiscal Policy Effectiveness and the Golden Rule of Public Finance.” *Central Bank Review*, vol. 18, no. 3, 2018, pp. 85–93., doi:10.1016/j.cbrev.2018.08.001.

REFERENCES



จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY



จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

VITA

NAME Thanatcha Varaputtanon

DATE OF BIRTH 19 September 1995

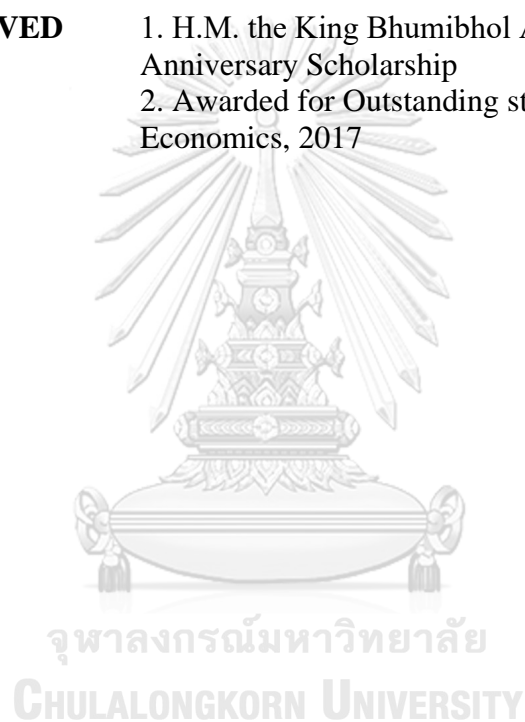
PLACE OF BIRTH Bangkok, Thailand

INSTITUTIONS ATTENDED Chulalongkorn University

HOME ADDRESS Bangkok, Thailand

AWARD RECEIVED

1. H.M. the King Bhumibhol Adulyadej's 72nd Birthday Anniversary Scholarship
2. Awarded for Outstanding student of Faculty of Economics, 2017





จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY