

**FISCAL DECENTRALIZATION, LOCAL
GOVERNMENT PERFORMANCE,
AND INCLUSIVE GROWTH**

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**A Dissertation Submitted in Partial
Fulfillment of the Requirements for the Degree of
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**FISCAL DECENTRALIZATION, LOCAL
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AND INCLUSIVE GROWTH**
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ABSTRACT

Title of Dissertation	FISCAL DECENTRALIZATION, LOCAL GOVERNMENT PERFORMANCE, AND INCLUSIVE GROWTH
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This research studies the impacts of fiscal decentralization on local government performance and inclusive growth. The unit of analysis was 76 provinces in Thailand (all provinces with the exception of Bueng Kan), and the research period was 2010 to 2017. The analysis of the economic growth model indicates that fiscal decentralization, excluding grants had a negative relationship with economic growth with no statistical significance, while fiscal decentralization, including grants had a positive relationship with economic growth with no statistical significance. However, local government performance had a positive statistically significant relationship with economic growth. The research results are used to develop policy recommendations on balancing revenue and expenditure decentralization of local government organizations and to increase the efficiency of human resources and utilities in order to achieve economic growth.

In addition, the research finds that grants allocated to local government organizations help to increase income distribution equality and reduce the number of poor. Moreover, increased per capita income is a key factor in reducing the number of poor people but this has no effect on income distribution equality. The policy recommendations on fiscal decentralization are made based on the research results, including those on improving local tax collection to be more fair and equitable and determine the criteria for the allocation of grants to local government organizations by focusing on poverty alleviation and income distribution equality.

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This dissertation was created based with the belief that the decentralization of power, including fiscal decentralization, is a key mechanism for raising awareness and appreciation of democracy on the basis of equality, human rights, liberty, obligations, and reasoning through the participation of general public, which will enable all groups to receive equal benefits and to oppose the unfair use of power which devalues and violates the fundamental principles of democracy.

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Finally, I would like to dedicate this dissertation to my beloved mom, Ms. Hattaya Wiwatchankij. However, the responsibility for any errors is my own. I sincerely hope that this study can be of help to those who are interested.

Thitinat Wiwatchankij

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TABLE OF CONTENTS

	Page
ABSTRACT.....	iii
ACKNOWLEDGEMENTS.....	iv
TABLE OF CONTENTS.....	v
LIST OF TABLES.....	viii
LIST OF FIGURES	xi
CHAPTER 1 INTRODUCTION	1
1.1 Background and Problem Statement	1
1.2 Objectives of the Study	10
1.3 Objectives of Study	10
1.4 Benefits of the Study	11
1.5 Organization of the Study.....	11
CHAPTER 2 THE REVIEWS OF THAILAND’S DECENTRALIZATION	12
2.1 Thailand’s Decentralization Policy before the 1997 Constitution	13
2.1.1 The Beginning of Thailand’s Local Government Organizations	13
2.1.2 The Frozen Era of Thai Local Government Organizations.....	15
2.1.3 The Era of Democratization and Political Reform	18
2.2 Thailand’s Decentralization Policies after the 1997 Constitution.....	20
2.2.1 The Golden Era of Thailand Decentralization	20
2.2.2 The Trapped Era	23
CHAPTER 3 REVENUE STRUCTURE OF THAI LOCAL GOVERNMENT ORGANIZATIONS.....	27
3.1 Revenue Allocation to Thai Local Government Organizations	28
3.2 Revenue Structure of Thai Local Government Organizations	45
3.2.1 Total Revenue.....	46
3.2.2 Locally Levied Revenue.....	48
3.2.3 Surcharge Tax Revenue.....	52

3.2.4 Subsidized Grants.....	57
CHAPTER 4 LITERATURE REVIEW	59
4.1 Definitions of Decentralization and Fiscal Decentralization.....	59
4.2 Concepts and Principles of Fiscal Decentralization	62
4.3 Assignment of Local Government Expenditure	64
4.4 Assignment of Local Government Revenue.....	66
4.5 Concept of Grants.....	68
4.6 Fiscal Decentralization and Economic Growth	80
4.7 Concept of Inclusive Growth.....	83
CHAPTER 5 RELATED RESEARCH	89
5.1 Related Cross-Country Studies.....	89
5.2 Related Within-Country Studies.....	96
5.3 Related Studies in Thailand.....	103
5.4 Review of Research Related to Inclusive Growth.....	105
CHAPTER 6 RESEARCH METHOD	115
6.1 Measuring the Local Government Organization Performance.....	115
6.1.1 Technical Efficiency Analysis Using the DEA Method	115
6.1.2 Productivity Assessment Using the Productivity Index.....	121
6.2 Economic Growth Model	122
6.2.1 Fixed Effect Model.....	125
6.2.2 Random Effect Model	126
6.3 Hypotheses	126
CHAPTER 7 RESULTS	131
7.1 Data and Data Sources.....	131
7.2 Analysis of Local Government Capacity	133
7.2.1 The Central and Provincial Governments: Reflection of Public Policy.....	134
7.2.2 The Local Government Organization: Reflection of Practical Operations and Solutions	137
7.2.2.1 Samut Sakhon Province.....	137

7.2.2.2 Saraburi Province	144
7.3 Results of the Statistical Analysis	164
7.3.1 Descriptive Statistics	164
7.3.2 Diagnostic Testing.....	176
7.3.3 Multicollinearity Test	177
7.3.4 Heteroscedasticity Test.....	184
7.3.5 Autocorrelation Test.....	184
7.3.6 Unit Root Test	185
7.4 Results of the Relationship Testing with Economic Growth	186
7.5 Results of the Relationship Testing with Inclusive Growth.....	198
CHAPTER 8 CONCLUSION AND RECOMMENDATIONS	212
8.1 Conclusion.....	212
8.2 Suggestions.....	213
BIBLIOGRAPHY	223
APPENDICES	232
Appendix A Local Government Performance in Thailand	233
Appendix B Interviews Executives of the Local Government Organizations and Related Provincial Government Organizations	238
BIOGRAPHY	239

LIST OF TABLES

	Page
Table 1.1 Per capita Gross Regional Products (PGRP) Across Thai Regions at Current Market Prices.....	7
Table 1.2 Gross Regional Products (GRP) Across Thai Regions at Current Market Prices	8
Table 1.3 Distribution of Income by Income Class and Household Characteristics (%)	9
Table 1.4 Poor Proportion and Number of Poor People.....	10
Table 2.1 The Development of Thai Local Government Organizations	25
Table 3.1 Proportion of Local Government Revenue Classified by Types of Revenue before the Promulgation of the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act.....	29
Table 3.2 Comparing the Revenues of Local Government Organizations Based on the Previous Policies and the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act.....	33
Table 3.3 Revenue Structure of Local Government Organizations After the Promulgation of the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act Classified by Types of Local Government Organizations	37
Table 3.4 Comparison of the Local Government Revenue from 2001-2007	39
Table 3.5 Types of Tax Allocated to Local Government Organizations Classified by Types of Local Government Organizations	40
Table 3.6 Total Revenue by Types of Local Government Organizations	46
Table 3.7 Types of Revenue of Local Government Organizations	47
Table 3.8 Locally Levied Revenue Categorized by Types of Local Government Organizations.....	49
Table 3.9 Types of Locally Levied Revenue of Local Government Organizations	50

Table 3.10 Surcharge Tax Revenue Categorized by Types of Local Government Organizations.....	53
Table 3.11 Types of Surcharge Tax Revenue of Local Government Organizations ...	55
Table 3.12 Grants by Type of Local Government Organizations.....	57
Table 3.13 Subsidized Grants Allocated to Local Government Organizations	58
Table 4.1 Inclusiveness Matrix	88
Table 5.1 Summary of Research Studies on the Relationships between Fiscal Decentralization and Economic Growth	110
Table 5.2 Summary of Research Studies Intensive Growth	114
Table 6.1 Summary of the Assumption of Variables.....	130
Table 7.1 The Amount of Solid Waste Generated and Collected in 2017.....	138
Table 7.2 Amount of Solid Waste Collection in Samut Sakhon and Saraburi	154
Table 7.3 Number of Natural Resources and Environmental Protection Volunteers (NEV)	160
Table 7.4 Descriptive Statistics.....	169
Table 7.5 Pair-Wise Correlation Matrix	181
Table 7.6 Pair-Wise Correlation Matrix with Take Log.....	182
Table 7.7 Pair-Wise Correlation Matrix with Differencing.....	183
Table 7.8 Results of the Study Using the Pooled OLS Model with Economic Growth	188
Table 7.9 Results of the Study Using the Fixed Effect Model with Economic Growth	190
Table 7.10 Results of the Study Using the Random Effect Model with Economic Growth.....	192
Table 7.11 Summary of the Relationship of Variables.....	198
Table 7.12 Results of the Study Using the Pooled OLS Model with Inclusive Growth (IG1)	200
Table 7.13 Results of the Study Using the Pooled OLS Model with Inclusive Growth (IG2)	202
Table 7.14 Amount of Electricity Distribution.....	208
Table 7.15 Percentage of Households with Access to Electricity Services Classified by Household Poverty	209

Table 7.16 Average Spending of Foreign Tourists Travelling to Thailand Classified by Expenditure Types.....	209
Table 7.17 Summary of Relationship of Variables.....	211



LIST OF FIGURES

	Page
Figure 1.1 Average Growth of Thailand's Gross Domestic Products (GDP) between the 1960s and 2000s and 2010 and 2017	2
Figure 4.1 Effect of an Unconditional Grant	74
Figure 4.2 Effect of a Block Grant.....	75
Figure 4.3 Effect of a Project Grant.....	77
Figure 4.4 Effect of an Open-ended Matching Grant	78
Figure 4.5 Effect of a Closed-ended Matching Grant.....	79
Figure 4.6 Social Mobility Curves.....	85
Figure 4.7 Changes in Social Mobility Curve	87
Figure 6.1 Production Frontier Line Resulting from the DEA Method.....	117
Figure 6.2 Constant Returns to Scale Frontier and Variable Returns to Scale Frontier	119
Figure 6.3 Real Gross National Product from Technological Advancement	123
Figure 7.1 Classification of Three Solid Waste Management Clusters in Samut Sakhon.....	157
Figure 7.2 Public Participation Levels.....	159
Figure 7.3 Distribution of Variables	168
Figure 7.4 Lorenz Curve of the Variable of Fiscal Decentralization, Excluding Grants (FD) and the Variable of Fiscal Decentralization, Including Grants (FDG)	171
Figure 7.5 Proportion of Tourists to 1,000 People within Provinces from 2010-2017	172
Figure 7.6 Proportion of Electricity Distribution to 1,000 People within Provinces from 2010-2017	173
Figure 7.7 Proportion of Monthly Household Income to the Amount of Credits of Commercial Banks from 2010-2017.....	174

Figure 7.8 Proportion of Amount of Credits of Commercial Banks to 1,000 People in Provinces from 2010-2017.....	175
Figure 7.9 Proportion of the Number of Business Establishments to 1,000 People in Provinces from 2010-2017.....	176
Figure 7.10 Distribution of Variables	180



CHAPTER 1

INTRODUCTION

1.1 Background and Problem Statement

The middle-income trap is a situation which occurs in many developing countries. The concept of the middle-income trap was first mentioned in the article “An East Asian Renaissance: Ideas for Economic Growth”(Gill & Kharas, 2007), and has been of great interest and widely discussed since. The middle-income trap describes a situation in which a developing country with a high economic growth rate is successful in transforming its economic status from a less-developed into a middle income economy through the use of natural resources and the advantage of cheap labor. However, it remains unable to keep up with more developed economies with high levels of technology and innovation due to a lack of labor and technological efficiency, and it is also unable to compete against less developed economies that have cheaper labor and more diverse resource bases. In other words, the middle-income trap is a middle-income country’s struggle to compete with both low-wage countries and technologically advanced countries (Bulman, Eden, & Nguyen, 2017).

Thailand a developing country that has achieved centralized economic development. Figure 1 shows Thailand’s economic growth rates after implementing the National Economic Development Plans, beginning in the 1960s to the present day. During the 1960s, the Thai economy grew at the relatively high rate of 7.8%. The goal of the 1st National Economic Development Plan was to develop infrastructure and utilities and to accelerate rural development projects. From the 1970s to the 1980s, the economy grew at an average of 7.3%, when the government aimed to spread prosperity to regional areas, maintain price stability, transform the economic structure into an industrialized economy, and encourage exports to replace imports. During the 1990s, the Thai economy was increasingly linked to the world economy due to the expansion of trade, investment, investment banking, and real estate businesses, as

well as the relocation of foreign production bases to Thailand. As a result, Thailand enjoyed the success of national development and was regarded as the fifth “tiger” in Asia. It can be said that the success of Thailand’s economic development resulted from the advantage of cheap labor, the abundance of natural resources, and abundant economic opportunities.

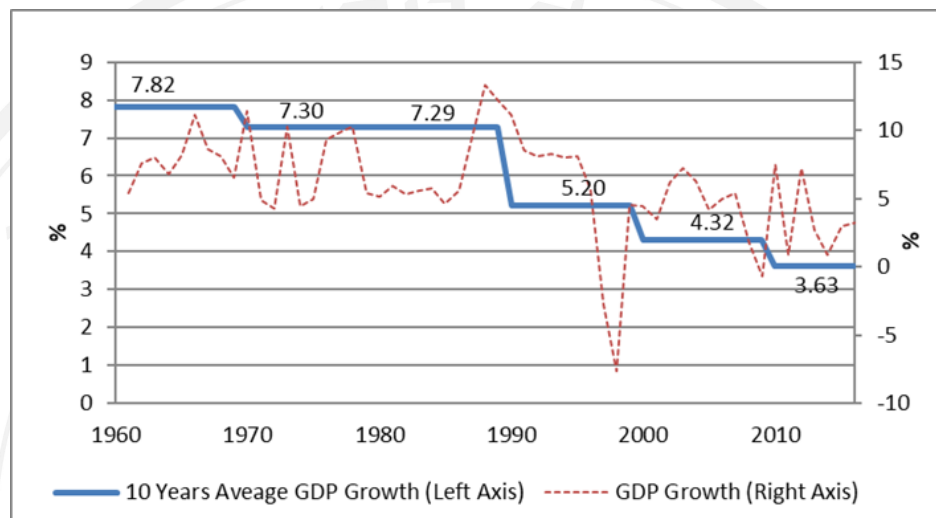


Figure 1.1 Average Growth of Thailand’s Gross Domestic Products (GDP) between the 1960s and 2000s and 2010 and 2017

However, Thailand’s economy severely contracted from 1997 to 1998 because of the economic crisis, which made the economic growth rate decrease to only 5.2%. During the 2000s, the Thai economy expanded by 4.2%, lower than the previous period. The country needed to recover from the economic crisis using the export sector its key mechanism. The economic recovery mainly relied on the baht depreciation and the expansion of free trade areas at the bilateral and multilateral levels. During the 2010s, the Thai economy expanded only 3.63%, which was the lowest since the introduction of the National Economic Development Plan. Thailand had to compete with major economic competitors, such as China, Vietnam, and India that have cheaper labor and abundant natural resources. In addition, Thailand was unable to compete against developed countries because the government had not focused on enhancing labor efficiency or improving production technology.

Due to these factors, it can be said that Thailand is caught in the middle-income trap because it has remained one of the middle-income countries since 1976. Moreover, it is estimated that, with the current economic growth rate of 3.5% compared to the global average economic growth rate of 1.0%, Thailand will continue to be caught in the middle-income trap for at least 30 years (Wongsindhuwiseth & Charunpipatkul, 2017). This is mainly due to Thailand's institutional weakness and the inability to adapt to economic uncertainty, which is considered a major barrier to long-term growth (Jitsuchon, 2012).

Jitsuchon (2012), Chareongwongsak (2015), and Wongsindhuwiseth and Charunpipatkul (2017) proposed that the problem of the middle income trap can be overcome by enhancing human resource efficiency, expanding investment in infrastructure to support economic growth, and developing innovation and technology to improve production efficiency. As there are various ways to deal with the problem of the middle income trap, the present research focuses on the use of fiscal decentralization policy, which many countries have adopted as a key strategy for reforming the public sector in order to satisfy the needs of the people and to enhance economic development.

Musgrave and Musgrave (1959) and Oates (1972) state that fiscal decentralization or fiscal federalism is a fiscal tool for achieving economic efficiency. Importantly, fiscal decentralization can improve the production and allocation of public services in a more efficient way than fiscal centralization because local governments are well aware of the needs of local people.

Although fiscal federalism does not directly address the relationships between fiscal decentralization and economic growth, there are empirical research studies suggesting the effects of fiscal decentralization on economic growth. (Oates, 1993, p. 240) indicates that fiscal decentralization enables local governments to formulate public policies for the benefit of citizens based on the needs of each local area. Locally formulated policies on infrastructure and human capital tend to contribute to economic development more than centrally formulated policies that often ignore geographical differences. Thus, fiscal decentralization can promote economic expansion. However, the relationships between fiscal decentralization and economic growth may vary. Oates (2005) explains that the main factors affecting the

relationships between fiscal decentralization and economic growth include different political economic contexts that indicate the relationships between the central and local governments in each country, incomplete and uncertain information received by central and local governments, and incentive structures of political and economic institutions because the goals of local government administrators may differ from those of society.

In Thailand, there have been attempts to implement fiscal decentralization since the 1932 revolution. However, due to the uncertain political environment and discontinuous democracy in Thailand, the concept of fiscal decentralization was formally introduced in 1997, more than 60 years after the Thai revolution. The provisions on decentralization were clearly stated in Section 78 and 284 of the 1997 Constitution.

Section 78 specifies that the State shall decentralize powers to localities for the purpose of independence and self-determination of local affairs, develop local economics, public utilities and facilities systems and information infrastructure in the locality thoroughly and equally throughout the country, as well as to develop into a large-sized local government organization a province ready for such purpose, having regard for the will of the people in that province.

Section 284 specifies that all local government organizations shall enjoy autonomy in laying down policies for their governance, administration, personnel administration, and finance, and shall have powers and duties particularly on their own part. The delineation of powers and duties between the State and a local government organization and among local government organizations themselves shall be in accordance with the provisions of the law, having particular regard for the promotion of decentralization.

In addition, the promulgation of the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act also reflected Thailand's more concrete implementation of decentralization policies, especially fiscal decentralization. Although the 1997 Constitution was later terminated by the military coup, the provisions on decentralization were also specified in the 2007 and 2017 Constitutions with the aims of emphasizing the importance of decentralization and to encourage the formation of public policies to meet the needs of the local people.

After Thailand set a clear policy on fiscal decentralization in accordance with the 1997 Constitution, regional economic development significantly expanded. Economic growth, which was once concentrated in Bangkok and its vicinity, has been increasingly distributed to localities. According to the per capita gross regional products (PGRP) across Thai regions (shown in Table 1.1) the PGRP of the Northeastern, Northern, and Eastern regions continued to increase, while the PGRP of Bangkok and its vicinity decreased from 3.12 in 1996 to 1.97 in 2017.

Table 1.2 also shows that the gross regional products (GRP) of Bangkok and vicinity decreased from 0.51 to 0.46 during the same period. The data shown in these two tables displays that each region in Thailand has played an increasing role in driving national economic growth for the past 20 years. Therefore, fiscal decentralization is not only a fiscal tool for achieving public service efficiency and effectiveness (Varanyuwattana, 2017), but is also part of a redistributive policy that helps to promote the role of regional economies as a driving force of the country's economic growth.

Thus, this dissertation aims to examine the effects of fiscal decentralization and local government performance on Thai economic growth and to use fiscal decentralization as a mechanism for improving government performance and enabling Thailand to overcome the middle-income trap. The researcher developed a new conceptual framework which differs from previous studies by using the data envelopment analysis (DEA) method and the productivity index in order to analyze whether fiscal decentralization was able to increase the efficiency and productivity of local government organizations during the research period. Local government performance was also used as a variable to test the relationship with economic growth.

However, one question that has attracted much attention in recent years concerns the quality of economic growth, especially in the dimension of income distribution and poverty related issues that are the result of economic expansion and which affect the general public. Everyone in society should be given equal opportunities to participate in inclusive growth, as the unequal distribution of economic growth may lead to political conflicts and national development barriers in the long term.

Socio-economic data from the National Statistical Office (shown in Table 1.3) concerning income distribution in Thailand indicates that in 2002, the income of the highest-income population alone accounted for 40 percent of the country's total income. This number began to decrease later while the income proportion of the population from other income groups increased. When comparing the income of the top 10 percent highest-income group with the lowest 10 percent income group, the proportion decreased from 24.50 times to 19.29 times in 2017, suggesting that the situation of income distribution in Thailand improved. However, the income distribution problem was not completely solved because the proportion was still high, reflecting inequality and the low quality of economic growth.

The Gini coefficient is commonly used as a measure of economic inequality. The closer the coefficient approaches 0, the greater the equality of distribution. The statistics showed that Thailand's Gini coefficient decreased from 0.5080 in 2002 to 0.4301 in 2019, indicating a decline in income inequality. However, when compared with developed countries, Thailand still has a high level of income inequality. Although Thailand still has many income distribution problems to deal with, it was found that the number of the poor in Thailand has continued to decrease, as shown in Table 1.4, which reflects the success of economic development policies in regards to poverty alleviation.

Therefore, in order to develop policy recommendations that can be used to enhance the quality of economic growth, it is necessary to understand the mechanisms of income inequality, which is one of the hardest problems in the Thai economic system to understand and solve, and to explore poverty alleviation measures. Thus, in this study, inclusive growth was used as a variable to assess the participation of related sectors in the growth process in order to reflect the success of the distribution of national development benefits through the dimensions of equal income distribution and poverty alleviation.

Table 1.1 Per capita Gross Regional Products (PGRP) Across Thai Regions at Current Market Prices

Region		1996	1999	2002	2005	2008	2011	2014	2017
1. Northeast		21,124	21,721	24,803	32,308	42,669	60,832	70,247	80,352
	1/8	0.27	0.28	0.27	0.27	0.29	0.36	0.36	0.35
2. North		32,569	33,305	37,861	50,224	64,465	79,706	96,593	103,760
	2/8	0.42	0.43	0.41	0.42	0.43	0.47	0.49	0.45
3. South		55,169	58,011	62,323	83,875	104,075	132,817	126,798	148,067
	3/8	0.71	0.75	0.68	0.71	0.70	0.78	0.64	0.65
4. East		147,681	150,397	191,189	272,706	366,190	386,292	432,420	500,676
	4/8	1.90	1.93	2.09	2.29	2.46	2.26	2.19	2.19
5. West		53,144	56,996	65,876	82,374	101,780	119,865	132,557	149,827
	5/8	0.68	0.73	0.72	0.69	0.68	0.70	0.67	0.66
6. Central		94,188	95,584	118,142	148,700	212,495	210,467	242,700	267,162
	6/8	1.21	1.23	1.29	1.25	1.43	1.23	1.23	1.17
7. Bangkok and vicinity		242,576	232,692	258,030	295,426	320,612	333,030	392,151	449,881
	7/8	3.12	2.99	2.82	2.49	2.15	1.95	1.99	1.97
8. All regions		77,836	77,799	91,641	118,876	148,953	170,764	197,459	228,398

Source: Office of the National and Social Development Council (2017)

Table 1.2 Gross Regional Products (GRP) Across Thai Regions at Current Market Prices

(Million Baht)

Region	1996	1999	2002	2005	2008	2011	2014	2017
1. Northeast	431,752 0.09	457,620 0.10	517,149 0.09	651,720 0.09	830,127 0.09	1,150,744 0.10	1,319,175 0.10	1,496,072 0.10
2. North	368,347 0.08	385,831 0.08	443,093 0.08	588,277 0.08	753,369 0.08	926,160 0.08	1,112,844 0.08	1,182,872 0.08
3. South	434,379 0.09	473,751 0.10	523,082 0.09	719,307 0.09	910,627 0.09	1,185,248 0.10	1,154,008 0.09	1,371,184 0.09
4. East	570,870 0.12	609,724 0.13	825,319 0.14	1,261,408 0.17	1,811,954 0.19	2,027,949 0.18	2,370,995 0.18	2,857,300 0.18
5. West	180,509 0.04	199,930 0.04	234,603 0.04	294,469 0.04	363,840 0.04	428,411 0.04	475,977 0.04	539,111 0.03
6. Central	273,204 0.06	282,470 0.06	355,265 0.06	454,020 0.06	657,262 0.07	656,998 0.06	760,724 0.06	838,307 0.05
7. Bangkok and vicinity	2,379,546 0.51	2,380,502 0.50	2,871,066 0.50	3,645,213 0.48	4,379,749 0.45	4,931,398 0.44	6,036,582 0.46	7,167,114 0.46
8. All regions	4,638,607	4,789,827	5,769,577	7,614,413	9,706,929	11,306,907	13,230,305	15,451,959

Source: Office of the National and Social Development Council (2017)

Table 1.3 Distribution of Income by Income Class and Household Characteristics (%)

Income Class	2002	2004	2006	2007	2009	2011	2013	2015	2017
The 1 st 10% Group (Lowest income)	1.61	1.75	1.34	1.55	1.62	1.56	1.06	1.58	1.83
The 2 nd 10% Group	2.57	2.73	2.46	2.66	2.80	3.05	3.10	3.34	3.20
The 3 rd 10% Group	3.40	3.56	3.34	3.51	3.66	3.88	4.03	4.22	4.11
The 4 th 10% Group	4.29	4.46	4.28	4.45	4.59	4.76	4.97	5.18	5.04
The 5 th 10% Group	5.35	5.55	5.39	5.56	5.65	5.77	6.07	6.29	6.17
The 6 th 10% Group	6.71	6.90	6.78	6.97	7.01	7.02	7.40	7.63	7.53
The 7 th 10% Group	8.59	8.73	8.67	8.86	8.84	8.66	9.15	9.33	9.28
The 8 th 10% Group	11.52	11.61	11.49	11.49	11.43	10.92	11.65	11.66	11.72
The 9 th 10% Group	16.48	16.41	16.26	16.08	15.95	15.11	15.77	15.78	15.83
The 10 th 10% Group (Highest income)	39.48	38.30	39.98	38.87	38.44	39.27	36.81	34.98	35.29
Total	100	100	100	100	100	100	100	100	100
Proportion of the 10 th 10% Group / the 1 st 10% Group (times)	24.50	21.93	29.90	25.10	23.76	25.23	34.85	22.08	19.29
Gini Coefficient	0.508	0.493	0.514	0.499	0.490	0.484	0.465	0.445	0.453

Source: National Statistic Office (2017)

Table 1.4 Poor Proportion and Number of Poor People

Year	Poor People Proportion (Percentage)	Number of Poor People (Thousand)	Population (Thousand)
2002	32.44	19,859	61,214
2004	26.76	16,549	61,840
2006	21.94	13,780	62,820
2007	20.04	12,718	63,452
2008	20.43	13,116	64,186
2009	17.88	11,624	65,027
2010	16.37	10,801	65,982
2011	13.22	8,752	66,214
2012	12.64	8,402	66,492
2013	10.94	7,305	66,755
2014	10.53	7,057	67,003
2015	7.21	4,847	67,236
2016	8.61	5,810	67,455
2017	7.87	5,325	67,654

Source: National Statistic Office (2017)

1.2 Objectives of the Study

- 1) To study the relationships among fiscal decentralization, local government performance, and inclusive growth in Thailand.
- 2) To provide policy recommendations regarding fiscal decentralization in order to increase long-term economic growth rates.

1.3 Objectives of Study

This study employs both qualitative and quantitative research designs. The qualitative research design was used to investigate the development of Thailand's fiscal decentralization policies, the theories of fiscal decentralization and economic development by focusing on economic growth, an indicator of economic development, and to comparatively analyze the waste collection performance of local government organizations.

The quantitative research design was applied to measure the efficiency of each local government organization through the use of non-parametric data envelopment analysis and to measure the productivity of each local government organization through the productivity index approach to examine the effects of fiscal decentralization and local government performance on economic growth through the use of panel data analysis. The unit of analysis was 76 provinces in Thailand (all provinces, with the exception of Bueng Kan), and the research period was 2010 to 2017.

1.4 Benefits of the Study

- 1) The results of this study will help to confirm the strength of fiscal decentralization and inclusive growth theories in the Thai context.
- 2) The results of this study can be used as a guideline for enhancing economic growth through fiscal decentralization policies.

1.5 Organization of the Study

This dissertation is organized into eight chapters. Chapter 1 introduces the background, research objectives, research design and unit of analysis, and the benefits of the study. Chapter 2 explains the evolution of decentralization in Thailand. Chapter 3 analyzes the revenue structure of local government organizations. Chapter 4 presents the literature review. Chapter 5 explores related studies, both domestic and international. Chapter 6 describes the research methodology and model used to test the hypotheses. Chapter 7 provides the research results divided into 2 parts: 1) the performance of local government organizations measured by the DEA and productivity index and a comparison of the solid waste management capacity of local government organizations, and 2) the relationships among fiscal decentralization, local government performance, and economic growth, including inclusive growth. Chapter 8 contains the conclusion, discussion of the results, policy recommendations, and suggestions for further research.

CHAPTER 2

THE REVIEWS OF THAILAND'S DECENTRALIZATION

Decentralization is a broad term referring to the transfer of power and public service responsibilities from the central government to local government organizations, independent agencies, or private organizations. Many countries implement a robust decentralization strategy by transferring the power to local government organizations with elected leaders, who have the power to make decisions on both income generation and spending, while some countries adopt a mild decentralization plan, depending on their political context. The most important element of decentralization is fiscal decentralization because it is associated with income generation and the spending of local government organizations. Thus, it is important to learn about the evolution of decentralization in Thailand in order to better understand the conditions of fiscal decentralization at the present time.

The concept of local decentralization was introduced to the Thai people after the constitutional revolution in 1932. Decentralization has been one of the efforts to improve local communities through the formation of local government organizations to better serve the needs of the locals. This chapter aims to outline the evolution of decentralization in Thailand, which is chronologically divided into two periods: first, the establishment and development of local government organizations before the 1997 Constitution, and second, after the promulgation of the 1997 Constitution, marking a new era in decentralization. Moreover, the 1999 Determining Plan and Process of Decentralization Plan Act provides a concrete decentralization framework signifying local government organizations' roles and responsibilities in public service provision.

2.1 Thailand's Decentralization Policy before the 1997 Constitution

2.1.1 The Beginning of Thailand's Local Government Organizations

Thailand's decentralization policy took off after the 1932 Constitutional Revolution by the People's Party (Kana Ratsadorn), which later legislated the 1933 Administrative Act for public administration. This act was structured primarily according to three levels of administration - central or national administration, provincial administration, and local administration. The People's Party had the bold intention of inducing decentralization policies at the local level by enacting the 1933 Municipal Administration Act (Thesaban Act), which marked the first law to systemize a self-governing system at the municipality level. The objective of the municipal administration act is to raise the status of the Tambon to local government organizations in the form of the Thesaban (municipality). As a consequence, there were 35 municipalities established in 1935 (Chayabutra, 1997).

The municipality was structurally composed of the municipal council (Sapa Thesaban) and the municipal executive committee (Kana Thesamontri). The municipal council members were elected from its citizens. The number of members varied across the different classes of the municipality. The municipal executive committee was selected from the members of the municipal council by the provincial governor with the approval of the municipal council. In theory, the municipal executive committee was accountable to the municipal council, which was responsible for the community's administration. The 1933 Municipal Administration Act was revised several times before being replaced by the 1953 Municipal Administration Act.

The establishment of the municipality was done at a gradual pace. There were only 117 municipalities established from 1935 to 1945, behind the target of 4,800 municipalities nationwide. The main reasons for the delay were the lack of a budget and the lack of knowledge of personnel regarding self-government. In addition, the early establishment of municipalities was initially the result of law enforcement, not initiated by the local people. Other subsidiary challenges for municipalities to pick up the pace were the challenges and difficulties faced by earlier-established municipalities to operationalize the entity, such as the inefficiency and ineffectiveness

of administrators, an inadequate income, and a lack of local peoples' participation (Charoenmuang, 1997).

Later, the government under General Pibulsongkram (former People's Party member) placed importance on local self-government in the rural areas as an essential development tool as well as a tool to extensively disseminate the idea of democracy. Subsequently, several local government laws were issued under General Pibulsongkram's government. The first was the enactment of the 1952 Sanitary District (Sukapiban) Act in order to build capacity and to prepare many large communities with the potential for promotion as a municipality when ready.

Under the Sanitary District Act, the organization was structured only by an executive board (Kana Kammakarn Sukapiban) comprised of mostly provincial officials, unlike municipalities that were comprised of councils and committees. The executive board was made up of three categories of members: ex-official members, members of the executive board appointed by the governor, and the elected members of the executive board. Structurally, the executive board was composed of the district chief officer (nai amphor) acting as the chairman, and the deputy district officer acting as the chief administrative official. In comparison to any other local government organization entities in Thailand, Sukapiban was the local government unit that had the closest relationship with the provincial administration as it was chaired by the district chief officer.

During General Phibunsongkhram's government, the parliament passed the Provincial Administration Organization Act (PAO) in 1955, which enabled other administrative organizations to form outside the municipality and sanitary district. This law created a new governing entity - the "Provincial (Changwat) Administration Organization," structurally composed of the provincial council (Sapa Changwat) and the provincial governor (Poowarachakarn Changwat). The provincial council consisted of members who were popularly elected, and the numbers of the council varied depending on the number of each province's population. The provincial governor was automatically appointed by law to be the chief executive of the PAO.

One year after the establishment of the PAO, the government pushed for the passing of a new law, resulting in the establishment of the district level administrative organization or Tambon. It was the first law to initiate the existence of Tambon

Administration Organization (TAO) in 1956. The TAO was composed of the Tambon council (Sapa Tambon) and Tambon committee (Kana Kammakarn Tambon). The Tambon council consisted of one elected member from each village as well as village heads and the Tambon chief officer (Kamnan). The Tambon committee was an executing unit whose members included all village heads in the Tambon, a medical practitioner, and no more than five members appointed by a district chief officer chaired by a Tambon chief officer.

As described above, during the first 25 years after the constitutional revolution, the People's Party promoted local government organizations by establishing various forms of local government units throughout the country in order to promote the idea of democracy, hoping to provide political education to the public, as well as to strengthen local people's capacity for self-governance under the local administrative regime. However, the progress of the Thai local administration was challenging, as the local governments lacked management capabilities. In addition, most local government's members were appointed from the central and provincial administration by law to monitor and control several local government levels, making it difficult for local government administrators to obtain autonomy to formulate policies that would respond to the people's needs.

2.1.2 The Frozen Era of Thai Local Government Organizations

After the coup in October 20, 1958 by General Sarit Thanarat, the ruling power of the People's Party faded, and Thai politics was dominated by bureaucrats and the military. General Sarit's junta government was not in favor of democracy, but in turn focused on political stability through force and order. It withdrew elections at all levels and drew attention to the country's economic development by introducing the first National Economic and Social Development Plan in 1961. Thai politics at that time was known as a "bureaucratic polity" (Riggs, 1966). Under this polity, bureaucrats as opposed to elected politicians, were the decision makers on resource allocations and the distribution of political power. By forming a so-called "government party" the cabinet comprised of bureaucrats was therefore more responsive to the interests and demands of their bureaucratic subordinates than

political parties, legislative bodies outside the state apparatus, or other interest groups (Riggs, 1966).

The bureaucratic polity was the major obstacle to the development of local government organizations because bureaucrats could maintain control over the political arena. The bureaucratic polity brought significant consequences for local government organizations as it overshadowed local government authorities and challenged local people's participation. Local governments were tightly controlled and dominated by the bureaucrats both from the central and provincial governments. In addition, local authorities were controlled by officers from the central government rather than locally elected representatives (Chardchawarn, 2010).

An example of local operation under bureaucratic polity was the diminishing of the roles and responsibilities of the provincial administration organization that had little influence over either provincial development or the work of the provincial administration. Moreover, the government under General Thanom abolished the Tambon administration organizations and set up the Tambon council by coup order No. 326 in 1972. The significant difference between the Tambon administration organization and the Tambon council was that the Tambon council, chaired by the Tambon chief officer (Kamnan), was responsible for development projects approved by the district officer (nai amphor). The Tambon council then became an administrative entity under the provincial administration (Phongngam, 2016).

According to Charoenmuang (1997) analysis, Thailand's local administration pattern was influenced by polarized world politics during the cold war period. This was the external factor supporting authoritarianism, which was at the fundamental root of Thai society, and strengthened the centralization of power. In addition, the Thai elites also were of the opinion that strengthening local governments was a threat to national security. As the result, policies on local government organizations in Thailand during that period were unclear and neglected.

However, bureaucratic polity ruling Thai politics over the decades were challenged by the educated middle class, resulting in an uprising called "The Thai Popular Uprising" on October 14, 1973. After the incident, Thailand gained an elected government and authoritarianism, along with bureaucratic polity, were thus

subsequently greatly weakened. Thai people became more politically aware and revived support for decentralization.

After the Thai popular uprising in 1973, the 1975 Bangkok Metropolitan Administration Act was promulgated, resulting in the establishment of the Bangkok Metropolitan Administration (BMA). It was later replaced by the 1985 BMA Act for efficiency. The BMA divided its administrative boundaries into districts and sub-districts. Each district was administered by the district director, and the district council acting as the advisory body of the district. The structure of the BMA consisted of three components: the Bangkok Metropolitan Assembly; the Governor of the BMA; and the District and District Council. The Bangkok Metropolitan Assembly was formed by 4-year - term elected members; the Governor of the BMA, who served as the highest executive, and the district council members.

In addition to the BMA as a self-governing city, the City of Pattaya Administration Act, proposed by the Ministry of Interior was promulgated in 1978. The main objective of this act was to allow Pattaya to become a self-governing city by forming a local government organization. The American system of “city manager” or “council and manager form” was adopted into the formulation of the Pattaya governing system. The Pattaya administration was structured according to two main bodies: the Pattaya city council and the city manager. The Pattaya city council is comprised of members elected directly by the people and those appointed by the Ministry of Interior. The city manager is the administrator of Pattaya, who is hired under a contract signed by the mayor according to the approval of the city council. The main concept of this structure is to separate responsibilities between the legislative and executive bodies. Therefore, Pattaya city was the first and only local government unit in Thailand that had a professional administrator through an employment contract and not through political selection means.

In sum, Thai local governments during the 1960s-1970s experienced a downfall, as decentralization policies did not continue to be cherished after the People Party’s term, together with the junta Sarit regime saw democracy as a threat and therefore withdrew elections at all levels. Thai politics became known as a “bureaucratic polity,” in which bureaucrats had a strong role and were appointed to offices both in the parliament and the cabinet. However, the bureaucratic polity was

challenged by the educated middle-class in the 1970s as a result of previous economic development policies. The new middle-class began to see authoritarianism as a problem and saw the need to participate in politics. “The Thai popular uprising” therefore was the result of the active political awareness of the Thai people, which drove the impetus for local decentralization policies such as the BMA Administration Act and the City of Pattaya Act.

2.1.3 The Era of Democratization and Political Reform

In the 1980s, the Thai political context began to change as the bureaucrats and military whom previously held decision-making power stepped down, while politicians with the support of the middle class participated increasingly in the political arena. In this context, the Thai political regime was known as a “semi-democracy.” The external push towards liberal democracy was due to the influence of many socialist and communist countries, which had become liberal democracies and adjusted their socio-economic policies accordingly at the end of the cold war in the late 1980s.

In Thailand, General Chatchai Choonhawan, the leader of the Chart Thai Party, became the first elected Prime Minister in 1988 through a victory where he and his party received the majority of seats in the general election. It was the first time an elected politician was appointed prime minister position since October 6, 1976. This marked the end of the “semi-democracy” regime. The Thai economy greatly flourished due to Chatchai government’s active economic promotion, to the point that Thailand nearly became a member of the Newly Industrialized Countries (NICs). This economic progress resulted in the emergence of a new economic middle class, bringing popularity and appreciation to the elected government and prime minister.

However, Chatchai’s government was overthrown by a coup d’état on February 23, 1991 by the National Peacekeeping Council (NPKC), led by General Sunthorn Kongsompong. After the coup, the NPKC inherited its regime through the support of General Suchinda Kraprayoon to win the 1992 election. The process was objected to by the public as it was not won by just means. An uprising took place to demand general Suchinda’s resignation and this event led to the Black May tragedy.

After the Black May event, Thailand entered into an unprecedented period of democratization where public political awareness was at its peak. The new democratic government revived and improved local decentralization laws after two decades of halt. The Ministry of Interior proposed that 1972 Revolutionary Order No. 326 be replaced by the Tambon Council and the Tambon Administration Organization Act 1994. According to the Act, the Tambon (sub-district), with its own territory outside the sanitary district and municipality, would be granted full juristic status and executive power through the administration of the Tambon council. Other Tambon councils operating in any Tambon, which could generate their own annual revenue no less than 150,000 Baht in three consecutive years, would also be upgraded to a TAO.

The 1997 Provincial Administration Organization Act was later promulgated, replacing the 1955 Provincial Administration Organization Act, in order to signify the administrative power under their responsible boundaries so that the TAO and PAO would not overlap. The major change in this act was to signify the election of the PAO chief executive instead of designating the provincial governor as the chief executive of the PAO. Furthermore, the act appointed coordination and collaboration among other local government organizations at a lower level within the province.

As mentioned, the domestic and international democratization trends were the driving force behind Thai political reform towards decentralization. One of the key factors that led to democracy was that the development of local government organizations allowed public participation in self-governance, which had boldly emerged during the 1997 Constitution drafting period.

From the 1980s until the pre-1997 constitution, the Thai political system changed dramatically. The middle class and politicians, who had benefited from economic growth, became increasingly politically involved and therefore demanded the negotiation of benefits with the old regime; the bureaucracy and the military. With the rise of new political forces, the influence of bureaucracy and the military under the bureaucratic polity faded, especially after Black May 1992. The Thai people were convinced that democracy was the way forward for Thai politics and elections at all levels were deemed a justified means for public political participation.

2.2 Thailand's Decentralization Policies after the 1997 Constitution

2.2.1 The Golden Era of Thailand Decentralization

Political reform became a heated topic after Black May 1992. Many ideas were proposed by political parties, academics, and the general public for reformation. Local decentralization became one of the topics for reform at the foundation of Thai politics. The 1997 Constitution, also known as “the People’s Constitution,” was the first constitution to promote and include decentralization policies and the development of local government organizations. This had implications for legislative as well as political reforms, bringing significant changes to the development of local government institutions (Phongngam, 2016).

The important section in the 1997 Constitution which supported local decentralization was Section 78. It proposed the following:

The state shall decentralize power to localities for the purpose of independence and self-determination of local affairs...as well as develop into large-sized local government organizations a province ready for such purpose, having regard to the will of the people in that province.

Section 284 of the 1997 Constitution suggested that there must be a provision by law stipulating the division of powers and duties in providing public services between central and local governments, as well as among local governments themselves. The law must also stipulate the allocation of taxes between the central and local government organizations. As a result of section 284, the 1999 Determining Plan and Procedures of Decentralization Act were promulgated.

Section 285 also stated that local government organizations would acquire local assembly members who must be directly elected by the people and executive committees or executive administrators who may come from direct elections or from approval by the local assembly. The local executive committees or executive administrators were not be a government official holding a permanent position.

Between 1997 and 2002, decentralization policies were implemented progressively through the elected government. An example of these policies was the restructuring of local government organizations in compliance with the principles of

local independence under the constitution. Another example is that the status of the sanitary district (Sukhapiban), which was upgraded to a municipality in 1998. The 1999 Determining Plan and Procedures of Decentralization to the Local Government Organization Act was promulgated to equip local government organizations with decentralization working protocols.

The contents of the 1999 Determining Plan and Procedures of Decentralization to the Local Government Organization Act are discussed below (Lerdphitun, 2006).

1) To organize committees in decentralization to local government organizations composed of three parties, namely representatives from government agencies, representatives from local government organizations, and representatives from professionals. Their responsibilities are identifying the duties and revenue and tax allocation to local government organizations and identifying the criteria for job transference from the central and provincial governments to local government organizations. It includes the coordinating of job allocation among the civil staff, the local official staff, and state enterprise employees to local government organizations.

2) To identify clearer authority between the central and local government organizations, and also among large local government organizations as provincial administrative organizations and small local government organizations, such as the sub-district administrative organization and municipality.

3) To provide higher authority such as education services, off-shore, and on-shore transportation services, wastewater treatment, and market management. In case of overlap and unclear situations, the committee would be able to identify whether local government organizations or another body would be responsible.

4) To appropriately allocate the portion of tax and duty between the central and existing local government organizations and among new local government organizations with the aim to generate higher revenues for local government organizations through the revision of existing tax measures, such as value added tax where local government organizations previously received less allocation. However, this law states that a local government organization will obtain 30 percent of the total value added tax following the revenue code. Therefore, a local government organization has to issue the rule to collect no more than 30 percent of tax according

to the revenue code. It is the responsibility of the Revenue Department to collect the tax based on the determined rule.

5) To first provide a decentralization plan for local government organizations in Thailand, the plan has to identify the indicators, goals, and procedures to implement following section 30 of the 1999 Determining Plan and Procedures of Decentralization to the Local Government Organization Act and the ideal of the 1997 Constitution. The main goal of this mission is the allocation of public service activity belonging to the government to be a local government organization within four years to be a ready organization and within 10 years for the rest. Additionally, the other main goal is the allocation of tax and duty, financial support, and other revenue to local government organizations in order to be in line with its duties and responsibilities. Local government organizations were expected to obtain 20 percent and at least 35 percent of the government income within 2001 and 2006 respectively. The proportion of local government organizations' income may continue to increase based on the transferred missions and duties.

The allocation of power among the central government and local government organizations following the 1999 Determining Plan and Procedures of Decentralization to the Local Government Organization Act were based on the subsidiarity principle; meaning that all decisions and actions concerning public services were to be done by local mechanisms, while some services beyond the capacity of local mechanisms were to be taken care of by higher-level organizations. In other words, the central government was merely given the role of decision making and implementing missions beyond the ability of local government organizations.

In the first five years after the promulgation of the 1997 Constitution, decentralization policies were driven by the government (Democrat Party at the time) and the general public. The 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act was held as the action plan for decentralization. Under the act, the decentralization committee chaired by the prime minister was established to settle responsibilities between central and local governments.

Consequently, a law was passed to make the local governments more democratic; local government administrators were required to be directly elected by

the public. This is considered a major breakthrough in Thailand's decentralization. However, after the Thai Rak Thai Government adopted the concept of CEO administration, a strong movement of anti-decentralization among central and regional government officials took place. The transfer of responsibilities and personnel to the local governments was delayed by the argument that the local governments were not ready for decentralization. As a result, in 2006, the proportion of the local government revenue was 25 percent of the total revenue; 35 percent below the target. This led to an amendment of the Determining Plan and Procedures in Decentralization to the Local Government Organization Act in 2006.

2.2.2 The Trapped Era

From 2002 to 2006 local government laws were amended to become more democratic. For example, the amendment to include the election of the executive administrator by the people in that locality, which stabilized the operation of local government organizations. However, many incidents signaled unclear decentralization policy directions. The Thai Rak Thai government, operating under its so-called "CEO Administration," emphasized the role of the prime minister and ministers in issuing public service policies. This had, in a way, centralized decision-making power from the locals. Clear lines were drawn to restrict the power of the provincial administrative organization to not exceed the powers of the Provincial Governor or overshadow that of the lower local level. The CEO-type administration would stop the transfer of duty from the Ministry of Public Health, the Ministry of Education, and the Ministry of Interior to local government organizations and instead, these were administered directly from the center (Kreuthep, 2013). Moreover, the 1999 Determining Plan and Procedures of Decentralization to the Local Government Organization Act expected the increase of the local government revenue to be continuous at least three percent per year to meet the expected target of 35 percent in 2006. Conversely, the Thai Rak Thai Government increased the proportion of the local government revenue by only 1 percent per year, resulting in local government revenue of 25 percent at the end 2006 (10 percent below target).

In addition to the Thai Rak Thai Government, which seemed to degrade decentralization, some civil servant groups also began to resist the decentralization of

power, as they saw that the local governments were neither ready nor capable of being in charge of public services. A protest led by teachers, which sought to prevent the transfer of public education under local government organizations was one example of this. Civil servants under the Ministry of Interior felt that local government organizations rivaled the provincial administration led by provincial governors (bureaucrats). There were attempts to dissolve provincial administration organizations as the responsible areas and population overlapped. It was later dropped as it contradicted the constitution (Kreuthep, 2013).

The 1997 Constitution had been enacted for nine years before being aborted due to a coup led by General Sonthi Boonyaratkarin in 2006. After that event, political conflict in the country intensified. The 2007 Constitution was drafted to include and retain decentralization-related policies based on transparency, ethics, and the principle of local participation in keeping checks-and-balances. In addition, the 2007 Constitution resolved previous disagreements in decentralization including resolving staff resistance for cooperation in the decentralization process; rightly entitling government agencies with the responsibility by law to inspect local governments and the transfer of revenue, human resources, and the allocation of budgets to subsidize the management of local government organizations.

However, the governments under the 2007 Constitution did not move towards decentralization as they were occupied with national conflict resolution, which required prioritization. Decentralization policy implementations, therefore, were carried out by central politicians and civil servants and the take-over tended to weaken the power of local governments. General grants allocated from the central government to subsidize local operations were reduced and specific grants for specific purposes were increased. The specific portion allowed politicians to gain benefits from local governments. Some unplanned tasks were also especially assigned without budget allocation. For these reasons, the local governments did not have the fiscal autonomy and fell into 'Hamilton's paradox'. Many local governments had to transfer responsibility back to the central government because the responsibilities were beyond their budgetary capacities.

The government agencies responsible for the legal enforcement and interpretation of decentralization policies, such as the Department of Local

Administration, the Office of the Council of State, the Bureau of the Budget, and the State Audit Office of the Kingdom of Thailand, played roles in relocating power back to the central government. Furthermore, these agencies issued regulations based on the residuality principle (instead of the subsidiary principle), which was commonly used before the 1997 Constitution which complied with the 1999 Determining Plans and Process of Decentralization to the Local Government Organization Act.

The coup by the National Council for Peace and Order (NCPO) in 2014 abolished the 2007 Constitution and introduced the 2017 Constitution, where the essential content regarding decentralization remained unchanged. A slight addition to Chapter 14 of the 2017 Constitution was to assign local government organizations the task of gaining revenue through taxes in order to be able to efficiently perform duties in providing public services.

Although the 2017 Constitution emphasized the essence of local decentralization, the long-lasting political turmoil for over a decade raised questions as to whether the election was still a mechanism under democracy for conflict resolution. The dictatorship regime after the coup suppressed the political conflict in a way that the elected government could not do. This phenomenon was to significantly affect the democratic attitudes toward local decentralization in the future.

Table 2.1 The Development of Thai Local Government Organizations

Name of Era	Periods	Important Characteristics
The Establishment of the Local Government Organizations	1930s-1960s	The People Party established local government organizations throughout the country in order to educate Thai people about democracy, especially familiarizing locals with the concept of local governance. During this era, however, most local government members were appointed from the central provincial administration by law. As a consequence, local government organizations lacked the autonomy to formulate policies that responded to the peoples' needs.
The 'Frozen Era'	1960s-1970s	The Thai local government organizations saw a downturn because the central government at that time saw democracy as a constraint to economic development and thus ordered the withdrawal of elections at all levels. Thai politics was known

Name of Era	Periods	Important Characteristics
		as a ‘bureaucratic polity’, which was later challenged by the middle-class in the 1970s. Thai people became very active and politically aware, which became the driving force for decentralization, and consequently drove the development of the BMA Administration Act, the City of Pattaya Act and others.
The Era of Democratization and Political Reforms	1980s-1997	The economic middle class and politicians became increasingly politically powerful and negotiated benefits with the old regime. As a result, the bureaucracy and the military under bureaucratic polity were greatly overshadowed, especially after Black May 1992. The Thai people were convinced that democracy was the hope for the future of Thai politics and that elections at all levels were a justified means for public political participation.
The Golden Era of Decentralization	1997-2006	Decentralization policies were driven by the government and the public. The 1999 Determining Plans and Process of Decentralization to the Local Government Organization Act was enacted as an action plan for decentralization. Under that act, a decentralization committee was formed to draft local administration policies, which clearly separated responsibilities between central and local governments for different roles of service provision.
The Trapped Era	2006-Present	Local government law was amended to become more democratic. However, many incidents led to unclear decentralization policy directions, such as the Thai Rak Thai government’s concept of CEO administration centralizing local government power. Civil servants began uprising against decentralization because local government organizations seemed unprepared to handle transferred duties. In addition, the government time did not have a clear decentralization policy, occupied by national political conflict.

CHAPTER 3

REVENUE STRUCTURE OF THAI LOCAL GOVERNMENT ORGANIZATIONS

The previous chapter presented the evolution of Thailand's local administration and decentralization in order to explain the background of fiscal decentralization in the Thai political context and to create understanding of the conditions of Thailand's fiscal decentralization. In this chapter, the revenue structure, including locally levied revenue, surcharge tax revenue, shared tax revenue, and subsidized grants of Thai local government organizations are presented in order to reflect the capacity and ability of each type of local government organizations.

Currently, there are many types of local government organizations in Thailand with different purposes. However, according to Thai law, local government organizations can be divided into two main types, as follows:

- 1) General local government organizations are comprised of the Provincial Administrative Organization (PAO), the municipality, and the Tambon Administrative Organization (TAO). The PAO is a large local government organization, covering municipalities and TAOs. It has the power to prepare a provincial development plan, provide support, and coordinate with smaller local government organizations. The municipality and TAO are small administrative organizations that have the power to manage public services within their area of responsibility.

- 2) Special local government organizations include Bangkok and Pattaya City. According to the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act, Bangkok is regarded as a large local government organization with the same power as a PAO, while Pattaya City is a small local government organization with the same status as a municipality and Tambon administrative organization TAO.

In 2017, Thailand had 7,853 local government organizations, which can be categorized as follows:

1) PAOs	76
2) Municipalities	2,441
(1) City Municipalities	30
(2) Town Municipalities	178
(3) Sub-District Municipalities	2,233
3) TAOs	5,334

There are 2 special local government organizations: Bangkok and Pattaya City.

3.1 Revenue Allocation to Thai Local Government Organizations

Local government revenue is a critical factor that can indicate the ability to use locally levied revenue to manage and provide public services to people in each local area. Local government revenue comes from many sources based on the law regarding the establishment of local government organizations, other relevant laws, and the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act, which is a law established after the promulgation of the 1977 Constitution of the Kingdom of Thailand (No.16) in order to allow local government organizations to obtain more revenue.

Before the promulgation of the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act, the proportion of the local governments' locally levied revenue without grants was only 26 percent of the total revenue, and more than 70 percent of the local government revenue was from taxes and fees collected by the central government, as detailed in Table 3.1. The revenue of local government organizations is allocated based on the criteria and types of revenue as follows:

1) Surcharges and shared tax revenue: the allocation of surcharges and shared tax revenue is carried out based on the following criteria:

(1) Criteria for the allocation of VAT: according to the 1991 Administration of Value-Added Tax and Specific Business Income Tax for Local Administration Act, the Ministry of Interior is responsible for allocating 1 in 9 of the

VAT charged under the Revenue Code to local government organizations. Bangkok is determined to receive 60 percent of the VAT allocated to local government organizations, while the other 40 percent must be allocated to the municipality, the sanitary district, and the PAO based on the revenue ratios of trade tax and commodity transaction tax, excluding the commodity transaction tax on gasoline. The revenue collected in the Pattaya area must be allocated to Pattaya City. In addition, the Provincial Administrative Organization Act 1997 determined that 5 percent of the VAT collected in each province under the Revenue Code must be allocated to the PAO in that area.

Table 3.1 Proportion of Local Government Revenue Classified by Types of Revenue before the Promulgation of the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act

Unit: Million Baht

	Type	1996	1997	1998
1	Local government revenue	46,718.0	64,371.8	66,457.9
	– Locally levied revenue	12,501.9	16,985.6	17,626.2
	(Proportion)	(26.76%)	(26.39%)	(26.52%)
	– Surcharge tax revenue	34,216.1	47,386.2	48,831.7
	(Proportion)	(73.24%)	(73.61%)	(73.48%)
2	Central government revenue	850,458.8	843,542.3	733,136.9
3	Ratio of local government revenue to central government revenue	5.49%	7.63%	9.06%
4	Central government grants allocated to local government organizations	18,236.0	29,507.6	31,378.9
5	Local government revenue, including central government grants	64,954.0	93,879.4	97,836.8
6	Ratio of local government revenue, including the central government grants to the central government revenue	7.64%	11.13%	13.34%

Source: Office of the Decentralization to Local Government Organization Committee (2017)

(2) Criteria for the allocation of alcohol tax and excise tax: the Ministry of Interior is responsible for allocating alcohol tax and excise tax after deducting 5 percent of the cost of storage to each local government organization by using the size of the population as a basis for allocation.

(3) According to the 1979 Automobile Act, the 1979 Land Transport Act, and the 1935 Non-Motorized Vehicle Act, all taxes and fees for automobiles and vehicles collected in a province must be allocated to that given province. Bangkok is regarded as a province. Within a province, the revenue from automobile and vehicle taxes and fees should be allocated to the municipality and sanitary district based on the proportion of 25: 50: 25. If a province has more than one municipality, the revenue must be equally allocated to every municipality. Pattaya City is regarded as a municipality in Chonburi Province. If there is more than one sanitary district in a province, the revenue must be equally allocated to every sanitary district. The allocation must be done 4 times a year, in October, January, April, and July.

2) Allocation of grants: before the enactment of the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act, there were no clear criteria for the allocation of grants. The Chuan Leekpai government and the Banharn Silpa-Archa government became interested in fiscal decentralization to local government organizations and allocated more grants to solve educational, infrastructure, traffic, and environmental problems in localities through the Department of Provincial Administration, the Department of Public Works, the Office of Accelerated Rural Development, the Subcommittee of Subdistrict Development Project, and local government organizations such as Bangkok and Pattaya City. In the first phase, there were two types of grants that were allocated, which included:

(1) General grants which were allocated to the municipality as the administrative budget because some local government organizations had insufficient revenue for handling regular administrative tasks and paying for salaries, wages, and allowances. The government had to allocate subsidized grants to them according to the size of the population. During the first phase, the grant criteria was determined at

20 baht per person. The budget continued to increase until reaching 120 baht per person in 1995.

(2) Specific grants were allocated to both the municipality and sanitary district to be used as a development budget. In the first phase, the government did not set clear allocation criteria and simply provided specific grants to local government organizations that requested a budget for their development projects based on necessity and suitability. Subsequently, when more municipalities and sanitary districts were established, the number of requests significantly increased until it exceeded the ability of responsible officials to consider the details of every project. Therefore, the criteria for the allocation of specific grants were finally set and specified in the Annual Budget Expenditure Act. All municipalities and sanitary districts, including Pattaya City, were allowed to submit a project proposal in order to receive specific grants according to the determined criteria, beginning in fiscal year 2004.

After the promulgation of the 1997 Constitution of the Kingdom of Thailand (No. 16), the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act and the Committee of Decentralization to Local Government Organization were established to be tools for determining guidelines for decentralization.

The key content of the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act regarding the fiscal and budgetary decentralization is shown below:

Section 12: The Committee of Decentralization to Local Government Organization shall have duties as follows:

(3) To improve the ratio of taxes and duties between the central government and local government organizations by considering the burdens of the central government vis-à-vis local government organizations and those among local government organizations themselves

(7) To recommend measurements in terms of finance, fiscal policy, taxes and duties, budget, and monetary and fiscal discipline of local government organizations;

(10) To advise the Council of Ministers about the increased budget allocation to local government organizations due to the mission transfer from central administration;

(11) To consider the regulations of subsidized fund allocation to local government organizations as necessary;

Section 23-25: municipalities, Tambon Administrative Organizations, and Pattaya City may receive income from taxes, duties, fees, and revenues.

Section 29: local government organizations shall receive income in conformity with the rules, procedures, conditions, allocation rate, income submission, and income acceptance as prescribed by the Committee by publishing in the Government Gazette.

Section 30 (4): the allocation of taxes, duties, subsidized funds and other income to local government organizations should be determined in harmony with the proceeding according to the power and duties of each type of local government organization. Within the period of not later than the year 2001, local government organizations shall receive the increased revenue in the ratio of government revenue of not less than 20 percent. In the period of not exceeding the year 2006, local government organizations shall receive the increased revenue in the ratio of government revenue of not less than 35 percent.

The Committee of Decentralization to Local Government Organization fulfilled its duty by determining the criteria for the allocation of revenue to local government organizations based on the guidelines stated in the decentralization plan to the local government organization, as follows:

- 1) The allocation of revenue to the local government organization must take into account the overview of all types of revenue by considering both the tax collected by the local government organization itself, the tax collected and distributed by the central government, and subsidized grants. If the revenue from the tax that the local government organization received is not sufficient to perform local administration duties, the shared VAT revenue and general grants will be used to reduce the revenue disparity among local government organizations.

- 2) The allocation of tax to the local government organization must consider the source of the tax. The collected tax must be allocated to the source of the

income giving rise to the tax. However, in practice, there is still a lack of information on the source of taxes at the local government level. Therefore, the collected tax is mainly allocated to the source of income recorded at the provincial level. Then the tax is allocated to all local government organizations in each province according to the size of the population they serve.

Table 3.2 Comparing the Revenues of Local Government Organizations Based on the Previous Policies and the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act

Type of Revenue	The Old Law	The 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act
1) Locally levied revenue	All types of local government organizations (TAO, PAO, municipality, Pattaya City, and Bangkok) have the power to collect tax under Section	All types of local government organizations have the power to collect taxes, except for the PAO.
1.1 Land and house tax		
1.2 Local development land tax	1.1 - 1.4. The PAO collects tax in the Tambon Council areas and submits it as the revenue of the Tambon Council.	
1.3 Sign tax		
1.4 Animal killing duty		
1.5 Swallow nest duty	The collected duty will be the revenue of local government organizations, where the swallow nests are harvested, and other local government organizations in Krabi, Trang, Satun, Chumphon, Prachuap Khiri Khan, Phatthalung, Trat, and Surat Thani.	The collected duty will be the revenue of all types of local government organizations. (The rate of duty is based on the old law.)
2) Revenue collected	Local government	All types of local government

Type of Revenue	The Old Law	The 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act
based on locally determined provisions.	organizations issue the provision to increase the	organizations have the power to issue the provision to increase the collection
2.1 Liquor tax	collection rate by 10%. The	rate, which should not exceed 30%.
2.2 Excise tax	specific business tax is not	The PAO only has the power to collect
2.3 Tobacco stamp	allocated to the TAO. The	specific business taxes.
2.4 Specific business tax	tobacco stamp was not collected as the revenue of local government organizations.	
2.5 Fuel tax, tobacco tax, and hotel occupancy fees	The PAO issues the provision to collect fuel tax and tobacco tax of no more than 5% per liter/ cigarettes and a hotel occupancy fee of 3%.	The PAO and Bangkok have the power to issue provisions to collect fuel tax and tobacco tax of no more than 10% per liter/cigarettes and hotel occupancy fees (no rate specified).
2.6 License fees for liquor selling and gambling	All types of local government organizations can issue the provision to increase the collection rate by 10%.	Details are the same except that the PAO has no power to issue any provisions.
3) Surcharge tax revenue/ shared tax revenue		
3.1 VAT	One in nine of the VAT charged under the Revenue Code is collected as the revenue of all types of local government organizations. The TAO does not receive 5% of the provincial VAT.	Not more than 30% of the VAT charged under the Revenue Code is the revenue of all types of local government organizations.
3.2 Taxes and fees for automobiles and vehicles	In the Bangkok area, the collected taxes and fees are the revenue of Bangkok. In other provinces, the collected taxes and fees are allocated to the TAO, municipality, and sanitary	In the Bangkok area, the collected tax and fees are the revenue of Bangkok. In other provinces, the collected taxes and fees are the revenue of the municipality (70%), PAO (20%), TAO (10%).

Type of Revenue	The Old Law	The 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act
	district.	
3.3 Mineral royalty fees	Fifty percent of the collected fee is the revenue of the TAO (30%) and PAO (20%),	The collected fee is the revenue of Bangkok (40%) and the municipality, TAO, and PAO (60%).
3.4 Petroleum royalty fees	Fifty percent of the collected fee is the revenue of the PAO (30%) and TAO (20%).	The same as mineral royalty fees.
3.5 Juristic acts and right registration fees	The collected fees are the revenue of the TAO in that area.	The collected fee is the revenue of all local government organizations in that area, except the PAO.
3.6 Gambling tax	The collected tax is the revenue of the municipality, Pattaya City, and Bangkok.	The collected tax is the revenue of all local government organizations, except the PAO.
4) New fees/taxes		
4.1 Education tax	None	The collected tax is the revenue of all local government organizations.
4.2 Airport fees	None	The collected fee is the revenue of all local government organizations.
4.3 Groundwater fees	None	The collected fee is the revenue of all local government organizations.

Source: Office of the Decentralization to Local Government Organization Committee (2017)

The 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act caused many significant fiscal changes at the local level, comprised of: 1) the revenue structure of local government organizations; 2) the allocation of tax to local government organizations; and 3) the allocation of grants to local government organizations. The details are presented below:

1) The Revenue Structure of Local Government Organizations

According to the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act, the revenue structure of local government organizations can be divided as follows:

(1) Locally levied revenue

(1.1) Locally levied tax consists of the following 6 items:

- (1.1.1) Land and house tax
- (1.1.2) Local development land tax
- (1.1.3) Sign tax
- (1.1.4) Animal killing duty
- (1.1.5) Swallow nest duty
- (1.1.6) Local maintenance tax from tobacco, fuel, and hotel occupancy fees (only for the PAO)

(1.2) Non-tax revenue consists of 4 items as follows:

- (1.2.1) License fees and fines
- (1.2.2) Revenue from utilities
- (1.2.3) Revenue from properties
- (1.2.4) Miscellaneous revenue

(2) Surcharge tax revenue

(2.1) VAT (as specified in the 1991 Administration of Value-Added Tax and Specific Business Income Tax for Local Administration Act and the 1997 Provincial Administrative Organization Act)

- (2.2) Specific business tax
- (2.3) Liquor tax
- (2.4) Excise tax
- (2.5) Automobile and vehicle fee
- (2.6) Juristic act and right registration fee
- (2.7) Mineral royalty fee and forest royalty fee
- (2.8) Revenue under the National Park Law
- (2.9) Gambling tax
- (2.10) Tobacco tax
- (2.11) Petroleum royalty fee
- (2.12) Groundwater fee

(2.13) Fisheries license fee

(3) Shared tax revenue includes the value-added tax (VAT) specified in the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act.

(4) Government grants consist of three items: general grants, purposive grants, and specific grants.

Table 3.3 Revenue Structure of Local Government Organizations After the Promulgation of the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act Classified by Types of Local Government Organizations

Type of Revenue	PAO	Municipality	TAO	Pattaya City	BKK
1. Locally levied revenue					
1.1 Locally levied tax					
1.1.1 Land and house tax		√	√	√	√
1.1.2 Local development land tax		√	√	√	√
1.1.3 Sign tax		√	√	√	√
1.1.4 Animal killing duty		√	√	√	√
1.1.5 Swallow nest duty	√	√	√		
1.1.6 Local maintenance tax from tobacco, fuel, and hotel occupancy fees	√				√
1.2 Non-tax revenue					
1.2.1 License fees and fines	√	√	√	√	√
1.2.2 Revenue from properties	√	√	√	√	√
1.2.3 Revenue from utilities	√	√	√	√	√
1.2.4 Miscellaneous revenue	√	√	√	√	√
2. Surcharge tax revenue					
2.1 Value-added tax					
2.2 Specific business tax		√	√	√	√
2.3 Liquor tax		√	√	√	√
2.4 Excise tax		√	√	√	√
2.5 Automobile and vehicle tax and fee		√	√	√	√
2.6 Juristic act and right registration fee		√	√	√	√

Type of Revenue	PAO	Municipality	TAO	Pattaya City	BKK
2.7 Gambling tax		√	√	√	√
2.8 Mineral royalty fee	√	√	√	√	√
2.9 Petroleum royalty fee	√	√	√	√	√
2.10 Revenue under the National Park Law			√		
2.11 Forest royalty fee			√		
2.12 Groundwater fee			√		
2.13 Fisheries license fee			√		
3. Shared tax revenue	√	√	√	√	√
4. Government grants	√	√	√	√	√

Source: Office of the Decentralization to Local Government Organization Committee (2017)

The central government has increased the revenue allocation to local government organizations every year. Therefore, the proportion of the local government revenue to the central government revenue continued to increase annually from 20.68% in 2001 to 21.88%, 22.19%, 22.75%, 23.50%, 24.05%, and 25.17% in fiscal years 2002 to 2007, as shown in Table 3.4.

Table 3.4 Comparison of the Local Government Revenue from 2001-2007

Unit: Million Baht

Type of Revenue	2001	2002	2003	2004	2005	2006	2007
1. Locally levied revenue	17,701.88	21,084.47	22,258.28	24,786.27	27,018.00	29,110.41	32,021.45
2. Surcharge tax revenue	55,651.90	58,143.52	60,217.71	82,623.27	102,520.34	110,189.59	120,728.70
3. Shared tax revenue	12,669.00	19,349.00	35,504.44	43,100.00	49,000.00	61,800.00	65,300.00
4. Grants	73,729.80	77,273.30	66,085.56	91,438.00	115,210.70	126,013.00	139,374.00
- Total local government revenue	159,752.58	175,580.29	184,066.03	241,947.64	295,750.00	327,113.00	357,424.15
- Total central government revenue	772,574.00	803,651.00	829,495.56	1,063,600.00	1,250,000.00	1,360,000.00	1,420,000.00
- Proportion of the local government revenue to the central government revenue	20.68	21.88	22.19	22.75	23.50	24.05	25.17

Source: Office of the Decentralization to Local Government Organization Committee (2017)

2) The Allocation of Tax to Local Government Organizations

Before the enactment of the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act, the allocation of taxes to all types of local government organizations were carried on an equal basis under the relevant laws such as the value-added tax (1 in 9) and specific business tax allocated under the 1991 Administration of Value-Added Tax and Specific Business Income Tax for Local Administration Act, the automobile and vehicle taxes and fees allocated under the 1979 Automobile Act, the 1979 Land Transport Act, and the 1935 Non-Motorized Vehicle Act, and other taxes allocated based on the prescribed ministerial regulations.

Table 3.5 Types of Tax Allocated to Local Government Organizations Classified by Types of Local Government Organizations

Type of Tax	PAO	Municipality	TAO	BKK	Pattaya City
1. VAT (1 in 9) under the Administration of Value-Added Tax and Specific Business Income Tax for Local Administration Act 1991		√	√	√	√
2. Specific business tax		√	√	√	√
3. Liquor tax and excise tax		√	√	√	√
4. Automobile and vehicle fee and tax	√				
5. Juristic act and right registration fee		√	√	√	√
6. VAT under the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act	√	√	√	√	√

Source: Office of the Decentralization to Local Government Organization Committee (2017)

However, after the promulgation of the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act, it was

determined that local government organizations must receive income in conformity with the rules, procedures, conditions, allocation rates, income submissions, and income acceptance prescribed by the Committee of Decentralization to Local Government Organization. In the past, problems and difficulties in the allocation of tax to local government organizations made it difficult to find an acceptable settlement among all local government organizations. Therefore, the Committee of Decentralization to Local Government Organization decided to revise the criteria for the allocation of tax to local government organizations in order to ensure fair allocation that truly reflected the source of income, as can be seen in Table 3.5.

3) The Allocation of Grants to Local Government Organizations

Although the locally levied revenue, surcharge tax revenue, and shared tax revenue were allocated to local government organizations, they still had insufficient money to perform their public service duties. The central government had to continuously provide them with subsidized grants. According to the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act, the central government must allocate tax, grants, and other revenues to local government organizations according to the specified ratio.

The Committee of Decentralization to Local Government Organization performed its duties as specified in the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act in regard to the allocation of grants based on the following principles.

(1) Encourage local government organizations to thoroughly provide public services, such as supplementary food, lunches, and elderly allowances at acceptable standards.

(2) Reduce fiscal gaps among local government organizations.

(3) Enable some local government organizations to implement government policies or solve problems beyond their fiscal capacities, such as providing grants for solving educational or environmental problems.

(4) Encourage local government organizations to increase their self-reliance based on their long-term revenue.

In addition, the principles of grant allocation also stated that general grants should be mainly provided because they give local government organizations

the freedom to fulfill both regular and transferred missions based on the actual needs of people in each local area. This was because, so far, a large number of purposive and specific grants were provided until local government organizations did not have enough general budget to deliver public services to local people. The Committee of Decentralization to Local Government Organization divided subsidized grants into three types as follows:

- 1) General grants are allocated to local government organizations without any conditions or obligations. The spending of this type of grant depends on the discretion of each local government organization.

- 2) Purposive grants, known as block grants, are allocated to local government organizations with the condition that the money must be spent on specified purposes only.

- 3) Specific grants, known as categorical or project grants, are allocated to local government organizations with clear conditions, objectives, and spending procedures. Therefore, local government organizations cannot exercise their discretion on any spending. Most specific grants are provided to support central government policies, especially large investment projects.

The criteria and procedures for the allocation of grants to local government organizations were modified on a yearly basis. The proportion of budget allocated to local government organizations continued to increase every year. Bangkok and Pattaya City could ask for government grants on their own according to the prescribed law. The PAO, municipality and TAO had to comply with the ratio, criteria, and procedures of the allocation of general, purposive, and specific grants to remain eligible.

The 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act determined that the ratio of the local government revenue to the central government revenue in 2006 had to be 35%. However, the actual proportion did not meet the specified target, resulting in the need to amend the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act at the end of 2006. Section 30 (4) was amended so that the allocation of taxes and duties, subsidized grants, and other income to local government organizations had to be determined according to the power and duties of

each type of local government organization as appropriate. Beginning with fiscal year 2007, a local government organization should receive increased revenue in the ratio of government revenue of not less than 35% by the fair allocation to local government organization in consideration of the income of that local government organization.

The increase of the revenue ratio should be performed during the period of time appropriate for developing local government organizations to be able to operate public services by themselves and to take into account the mission transferred to local government organizations after 2006. However, the number of grants allocated to local government organizations should not be less than the grants they received in fiscal year 2006. The 2006 Determining Plan and Procedures of Decentralization Act (No.2) was enacted on 29 December, 2006.

The main reason for the allocation of revenue to local government organizations to not meet the target (Kosrideachapan, 2008) were the following:

- 1) Government policy implementation: Lt. Col. Thaksin Shinawatra's government policy through the Thai Rak Thai Party (the 1st term from February 9, 2001 to March 9, 2005, and the 2nd term from March 9, 2006 to September 19, 2006) directly affects the revenue proportions of local government organizations. This was because the budget that the central government allocated to support government projects, including the 30-Baht Universal Coverage Program, the "One Tambon, One Product" (OTOP) Program, Village Fund Project, and the Debt Moratorium Program for Farmers, was directly provided to all villages nationwide through the "1 Million Baht per 1 Village" project, without being transferred through local government organizations.

Lt. Col. Thaksin Shinawatra's government spent more than 50 billion Baht per year on the 30-Baht Universal Coverage Program. The Ministry of Public Health directly allocated the budget to the National Health Security Office (NHSO) in each regional/provincial area without being transferred through the local government organizations as well. This interrupted the transfer of missions from the Ministry of Public Health to local government organizations, causing a large amount of budget unable to be allocated to local government organizations. There were also many government mega projects that needed to be concretely established, which required a

huge budget. Thus, in 2006 the government was unable to allocate the revenue to local government organizations according to the set target.

Another important factor was the role of government political representatives, who held positions in the Committee of Decentralization to Local Government Organization that had the power to determine the direction of the decentralization. As a result, decentralization policies were changed many times. The sincerity and determination of political parties were also needed to solve these long-term problems. Inconsistent decisions could affect the revenue proportions of local government organizations.

2) Relationships between central and provincial administrations and local government organizations: the administration of the Thai government is divided into three parts: central administration, provincial administration, and local administration. The provincial administration is a middle structure that links the central administration with the local administration, while local government organizations play an important role as the state's mechanism to directly provide services to people in each local area. Thus, it is necessary to consider the relationships between the central administration and local government organizations.

Although central government agencies were required to transfer missions to local government organizations as specified by law, most of them still believed that local government organizations were not ready for the transfer of missions. Moreover, central, and provincial administrators were also possessive of their administrative power and feared losing it. This was reflected in their frequent requests to review, improve, and delay the transfer of missions. If the transfer of missions could be completed within the specified time frame, a large amount of budget would have been allocated to local government organizations, making the revenue proportion of local government organizations increase according to the target.

In addition, the government's attempts to strengthen the central and provincial administrations, such as the bureaucratic reform under the 2002 Reorganization of Ministry, Sub-Ministry, and Department Act and the adoption of the CEO-governor scheme enhanced the expansion of the central administration and reduced the importance of the decentralization policies. Based on the CEO-governor scheme, governors had the power to manage and solve problems within the province

and received a very high budget to support their administrative duties without being allocated it through local government organizations. Although the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act was already enacted, it was not practically accepted and adopted as the administrative framework.

3) Duties of local government organizations: local government organizations were found to have limited duties in public service provisions. Their duties were limited by various laws. Local government organizations could not violate their own obligations or perform any duties unspecified in the laws. This meant they were unable to receive more budget allocation for the implementation of additional tasks and duties.

Another factor was the duplication of duties among local government organizations, which made it difficult to identify the appropriate size and source of income of each local government organization. In addition, the central government had no clear guidelines for the allocation of revenue, including taxes and grants, to local government organizations, which was not in-line with the revenue approach that focused on independent decision-making of local government organizations in terms of administrative spending, public service provisions and the expenditure which placed an emphasis on allocating revenue to local government organizations based on the scope of missions and budgetary needs. The allocation of budgets to local government organizations should have been done in a fair, worthwhile, and balanced way in order to make them achieve maximum benefit and efficiency in the management of their own income.

3.2 Revenue Structure of Thai Local Government Organizations

The revenue of local government organizations came from three main sources: 1) locally levied revenue; 2) surcharge tax revenue, and; 3) subsidized grants. The overview and analysis of the major sources of income of local government organizations are presented below:

3.2.1 Total Revenue

Table 3.6 shows the total revenue of all types of local government organizations during 2012-2017. The total local government revenue continued to increase from 481,304.25 million Baht in 2012 to 603,111.84 million Baht in 2017. The TAO is the local government organization with the highest total revenue. In 2017, it obtained a total revenue of 226,160.03 million Baht or 37.50% of the total local government revenue. This was because the TAO was the largest subset of the local government organization that served 70% of the Thai population. Its responsible area covered 95% of the nation.

Table 3.6 Total Revenue by Types of Local Government Organizations

Unit: Million Baht

Type of Local Government Organizations	2012	2013	2014	2015	2016	2017
PAO	63,570.38	67,174.27	65,167.73	68,593.64	67,670.49	66,713.79
proportion	13.21%	12.55%	12.16%	11.60%	11.59%	11.06%
Municipality	155,904.90	185,752.93	187,365.19	209,458.14	203,200.50	208,133.57
proportion	32.39%	34.70%	34.97%	35.42%	34.80%	34.51%
TAO	178,894.18	201,805.08	198,761.94	224,768.04	221,029.29	226,160.03
proportion	37.17%	37.69%	37.10%	38.01%	37.86%	37.50%
Pattaya City	3,249.20	3,415.39	3,527.48	3,722.21	3,645.48	3,935.25
proportion	0.68%	0.64%	0.66%	0.63%	0.62%	0.65%
BKK	79,685.59	77,221.19	80,923.47	84,767.16	88,319.94	98,169.20
proportion	16.56%	14.42%	15.10%	14.34%	15.13%	16.28%
Total	481,304.25	535,368.86	535,745.81	591,309.19	583,865.70	603,111.84
proportion	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Ministry of Interior. Department of Local Administration (2017)

The municipality was the local government organization with the second highest revenue with a total revenue of 208,133.57 million Baht or 34.51% of the total local government revenue. This was because the size and coverage of the municipality was only second to the TAO. Moreover, the municipality was located in the key

economic zone of each province. When looking at the total revenue of the local government organizations nationwide, it was found that the proportion of the total revenue of each type of local government organization to the total local government revenue did not change much during 2012-2017.

Table 3.7 Types of Revenue of Local Government Organizations

Type of Revenue	Unit: Million Baht					
	2012	2013	2014	2015	2016	2017
Locally levied revenue	43,745.41	48,326.56	52,489.71	56,700.93	58,115.73	62,033.98
proportion	9.09%	9.03%	9.80%	9.59%	9.95%	10.29%
Surcharge tax revenue	222,410.76	265,909.21	259,018.10	274,820.28	279,004.33	302,333.41
proportion	46.21%	49.67%	48.35%	46.48%	47.79%	50.13%
Grants	215,148.07	221,133.10	224,238.00	259,787.99	246,745.65	238,744.45
proportion	44.70%	41.30%	41.86%	43.93%	42.26%	39.59%
Total	481,304.24	535,368.87	535,745.81	591,309.20	583,865.71	603,111.84
proportion	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Ministry of Interior. Department of Local Administration (2017)

Considering the total revenue of local government organizations from 2012-2017 shown in Table 3.7, the amount of revenue increased continuously, except for the year 2016. The type of revenue reflected the sources of revenue that could be classified into three groups: 1) locally levied revenue; 2) surcharge tax revenue, and; 3) subsidized grants. In 2017, the highest source of income was surcharge tax revenue with 302,333.41 million Baht or 50.13% of the total local government revenue, followed by subsidized grants with 238,744.45 million Baht (39.59%), and locally levied revenue with 62,033.98 million Baht (10.29%). It should be noted that the proportions of locally levied revenue, surcharge tax revenue, and subsidized grants to the total revenue were quite constant. The locally levied revenue obtained was only 9-10% of the total revenue, which was considered a very small proportion. This might be due to restrictions from the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act applied to all local

government organizations which rescinded decision-making power on the types and rates of tax suitable for each local area.

The above information demonstrates the total revenue of each type of local government organization. The sources of revenue of Thai government organizations are presented and analyzed in the next section.

3.2.2 Locally Levied Revenue

Locally levied revenue reflects the efficiency and capability of local government organizations in finding their own source of revenue for operating activities, aimed at meeting the needs of local people, with freedom of spending. According to Table 3.8, the total amount of locally levied revenue was recorded at 62,033.97 million Baht in 2017. Overall, the amount of locally levied revenue continually increased from 2012-2017 by an average of 8% per year. Considering the revenue collection capability of each type of local government organization, Pattaya City had the highest capability to increase revenue at 12% per year, followed by the TAO (11% per year), the municipality (9% per year), and the PAO (8% per year).

The municipality was the local government organization with the highest locally levied revenue. In 2017, its locally levied revenue was 23,997.82 million Baht, accounting for 38.68% of the total locally levied revenue. As a large number of municipalities nationwide are located in the most prosperous zone of the province, they tend to have high revenue collection potential. Bangkok was found to have the second highest locally levied revenue of 19,199.85 million Baht. Although Bangkok has a small coverage area, it is the capital city located in the economic center and is the most advanced area of the country with a dense population. Therefore, it can collect a large amount of revenue. The TAO had the third highest locally levied revenue of 12,096.21 million Baht. Despite the fact that the area covered 95% of the nation, the proportion of its locally levied revenue to its area size or number of population is quite small. In addition, as most TAOs are located in rural areas, with limitations on taxation.

Table 3.8 Locally Levied Revenue Categorized by Types of Local Government Organizations

Unit: Million Baht

Type of Local Government Organizations	2012	2013	2014	2015	2016	2017
PAO	5,028.39	5,549.41	6,133.11	6,212.07	5,735.15	6,004.07
proportion	11.49%	11.48%	11.68%	10.96%	9.87%	9.68%
Municipality	16,658.42	19,020.55	20,473.89	21,941.55	23,014.58	23,997.82
proportion	38.08%	39.36%	39.01%	38.70%	39.60%	38.68%
TAO	7,796.69	8,766.78	9,750.20	10,960.24	11,480.36	12,096.21
proportion	17.82%	18.14%	18.58%	19.33%	19.75%	19.50%
Pattaya City	459.24	540.54	623.85	630.54	653.35	736.02
proportion	1.05%	1.12%	1.19%	1.11%	1.12%	1.19%
BKK	13,802.68	14,449.27	15,508.66	16,956.54	17,232.29	19,199.85
proportion	31.55%	29.90%	29.55%	29.91%	29.65%	30.95%
Total	43,745.42	48,326.55	52,489.71	56,700.94	58,115.73	62,033.97
proportion	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Ministry of Interior. Department of Local Administration (2017)

Table 3.9 Types of Locally Levied Revenue of Local Government Organizations

Type of Revenue		2012	2013	2014	2015	2016	2017
Land and house tax		21,067.04	23,103.25	25,077.01	26,939.97	29,059.80	32,008.16
	proportion	48.16%	47.81%	47.78%	47.51%	50.00%	51.60%
Local development land tax		904.24	933.85	895.58	932.29	953.67	957.00
	proportion	2.07%	1.93%	1.71%	1.64%	1.64%	1.54%
Sign Tax		2,232.14	2,438.63	2,615.46	2,799.08	3,057.50	3,260.23
	proportion	5.10%	5.05%	4.98%	4.94%	5.26%	5.26%
Local maintenance tax from tobacco fee		3,145.56	3,098.90	3,166.08	3,242.71	2,799.39	2,916.03
	proportion	7.19%	6.41%	6.03%	5.72%	4.82%	4.70%
Local maintenance tax from fuel fee		313.10	412.03	522.35	598.61	900.97	1,003.42
	proportion	0.72%	0.85%	1.00%	1.06%	1.55%	1.62%
Local maintenance tax from hotel occupancy fee		225.74	270.45	299.57	327.29	372.45	426.59
	proportion	0.52%	0.56%	0.57%	0.58%	0.64%	0.69%
Animal killing duty		70.71	76.00	77.42	85.14	95.93	112.04
	proportion	0.16%	0.16%	0.15%	0.15%	0.17%	0.18%
Swallow nest duty		382.76	335.86	291.17	215.01	656.97	252.84
	proportion	0.87%	0.69%	0.55%	0.38%	1.13%	0.41%
License fees and fines		4,885.23	5,535.93	5,853.13	6,397.96	6,858.01	7,619.00
	proportion	11.17%	11.46%	11.15%	11.28%	11.80%	12.28%
Revenue from properties		5,633.79	7,107.50	7,728.77	7,576.82	6,986.45	6,634.85
	proportion	12.88%	14.71%	14.72%	13.36%	12.02%	10.70%

Unit: Million Baht

Type of Revenue	2012	2013	2014	2015	2016	2017
Revenue from utilities proportion	1,847.36 4.22%	2,193.81 4.54%	2,509.42 4.78%	2,574.13 4.54%	2,689.31 4.63%	2,739.62 4.42%
Miscellaneous revenue proportion	3,037.73 6.94%	2,820.34 5.84%	3,453.75 6.58%	5,011.93 8.84%	3,685.28 6.34%	4,104.19 6.62%
Total proportion	43,745.40 100.00%	48,326.55 100.00%	52,489.71 100.00%	56,700.94 100.00%	58,115.73 100.00%	62,033.97 100.00%

Source: Ministry of Interior. Department of Local Administration (2017)

Above findings indicate that the land and house tax had the highest proportion of locally levied revenue from 2012-2017. In 2017, local government organizations were able to collect land and house tax of 32,008.16 million Baht or 51.60% of the total locally levied revenue. However, the land and house taxes were applied to buildings, establishments, and land, including the rental and commercial use of those properties, so this kind of tax was mostly collected in the urban areas. License fees and fines for businesses authorized by law, such as alcohol sales, gambling, building control and waste collection, had the second highest proportion with 7,619.00 million Baht or 12.28% of the total locally levied revenue. The revenue from properties had the third highest proportion with 6,634.85 million Baht or 10.70% of the total locally levied revenue. The revenue obtained from the above three sources accounted for 80% of the total locally levied revenue, while the revenue collected from other sources was relatively small. Therefore, in the future, the revenue collection capability of local government organizations needs to be improved and ways to collect revenue from additional sources need to be found so that local government organizations can obtain more locally levied revenue in order to produce and deliver public services that meet the needs of local people.

3.2.3 Surcharge Tax Revenue

According to Section 30 (4) of the 2006 Determining Plan and Procedures of Decentralization Act (No.2), the allocation of taxes, duties, subsidized funds, and other income to local government organizations should be determined in harmony with the power and duties of each type of local government organization. Most surcharge tax revenues were collected using a common tax base between the government and local government organizations, such as VAT, specific business taxes, liquor taxes, and excise taxes. Local government organizations obtained 10% of almost all types of surcharge tax revenue. However, there were some types of surcharge tax revenue that were 100% allocated to local government organizations, such as juristic acts and right registration fees and automobile taxes. The annual allocation criteria depended on the conditions set by the Committee of Decentralization to Local Government Organization.

Based on the surcharge tax revenue allocated to local government organizations (shown in Table 3.10), surcharge tax revenue continuously increased from 2012-2017. In 2017, total surcharge tax revenue reached 302,333.41 million Baht. The TAO obtained the highest surcharge tax revenue of 105,622.23 million Baht or 34.94% of the total surcharge tax revenue, followed by the municipality, which received 93,734.93 million Baht or 31.00% of the total surcharge tax revenue. The proportions of the surcharge tax revenue allocated to each type of local government organization to the total surcharge tax revenue from 2012-2017 did not see significant changes.

Table 3.10 Surcharge Tax Revenue Categorized by Types of Local Government Organizations

Unit: Million Baht

Type of Local Government Organizations	2012	2013	2014	2015	2016	2017
PAO	34,117.88	38,250.06	38,173.15	36,966.99	37,665.20	40,803.81
proportion	15.34%	14.38%	14.74%	13.45%	13.50%	13.50%
Municipality	66,481.93	81,738.96	80,523.76	88,169.23	86,960.89	93,734.93
proportion	29.89%	30.74%	31.09%	32.08%	31.17%	31.00%
TAO	74,856.60	95,857.25	87,760.03	95,801.95	98,458.13	105,622.23
proportion	33.66%	36.05%	33.88%	34.86%	35.29%	34.94%
Pattaya City	1,254.86	1,401.57	1,410.95	1,592.89	1,376.63	1,617.05
proportion	0.56%	0.53%	0.54%	0.58%	0.49%	0.53%
BKK	45,699.49	48,661.37	51,150.21	52,289.21	54,543.49	60,555.39
proportion	20.55%	18.30%	19.75%	19.03%	19.55%	20.03%
Total	222,410.76	265,909.21	259,018.10	274,820.27	279,004.34	302,333.41
proportion	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Ministry of Interior. Department of Local Administration (2017)

As seen in Table 3.11, the top three sources of the surcharge tax revenue included the following: 1) the VAT according to the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act, which was

allocated to each type of local government organizations based on the ratio and criteria annually modified by the Committee of Decentralization to Local Government Organization (106,287.02 million Baht or 35.16%); 2) the VAT according to the local law (55,381.53 million Baht or 18.32%); and 3) the juristic act and right registration fees under the Land Code, which was applied to the registration of title licenses relevant to the rental, sale, mortgage, and redemption of immovable property (35,852.94 million Baht or 11.86%). The revenue obtained for the above three sources accounted for more than 70% of the total surcharge tax revenue.

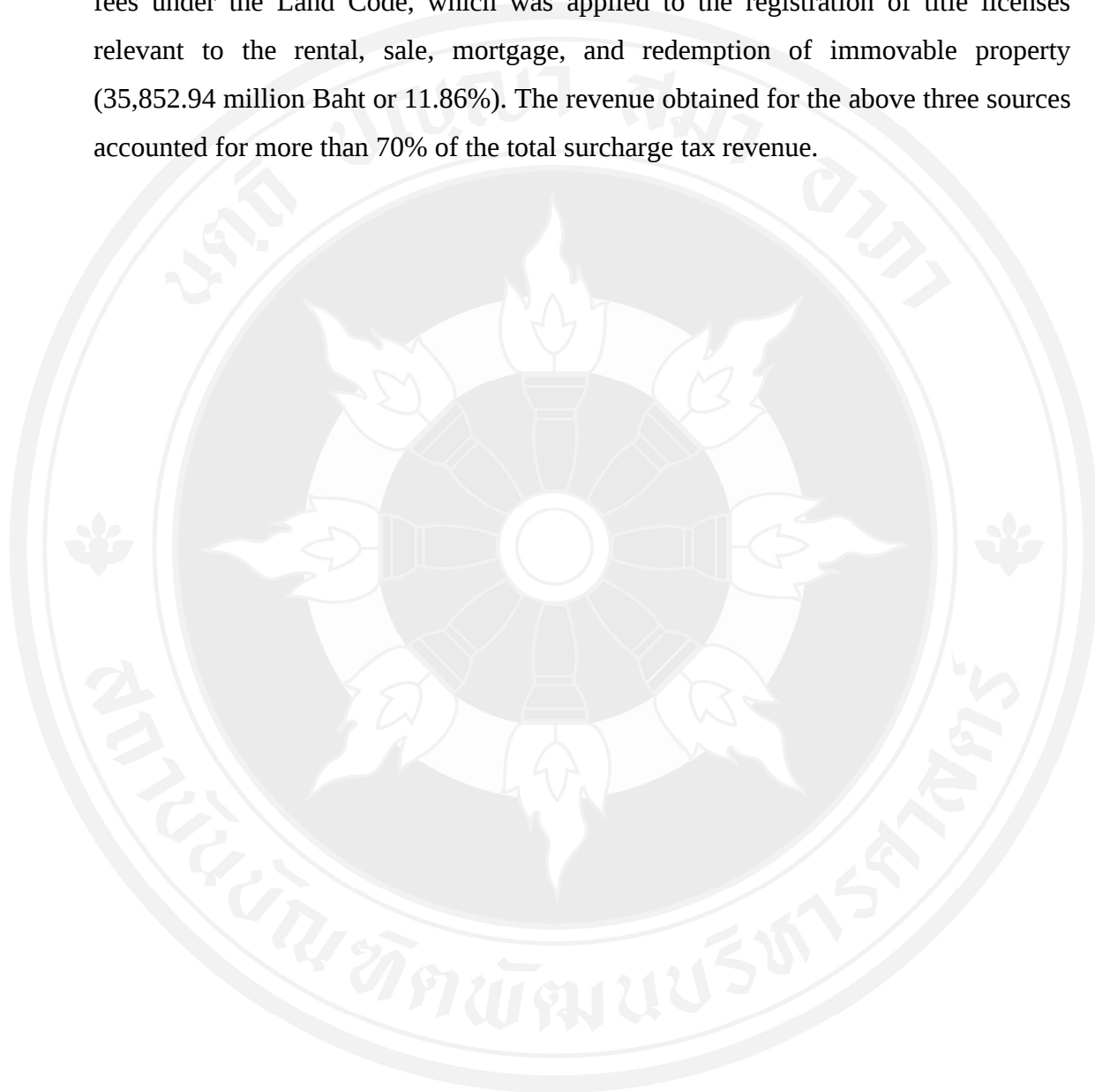


Table 3.11 Types of Surcharge Tax Revenue of Local Government Organizations

Type of Revenue	Unit: Million Baht				
	2012	2013	2014	2015	2017
Automobile and vehicle tax and fee	27,335.59	26,398.77	29,054.53	29,413.46	31,631.51
proportion	12.29%	9.93%	11.22%	10.70%	11.34%
VAT according to the PAO Act 1997	8,320.27	10,536.60	10,838.08	11,237.09	11,699.87
proportion	3.74%	3.96%	4.18%	4.09%	4.19%
VAT according to the Administration of VAT and Specific	44,104.77	47,680.88	49,100.20	50,497.01	52,370.94
Business Income Tax for Local Administration Act 1991					55,381.53
proportion	19.83%	17.93%	18.96%	18.37%	18.77%
VAT according to the Determining Plan and Procedures of	76,159.62	101,147.15	96,130.65	98,680.24	102,368.16
Decentralization Act					106,287.02
proportion	34.24%	38.04%	37.11%	35.91%	36.69%
Specific business tax	4,066.39	4,781.27	4,970.15	5,229.58	5,554.65
proportion	1.83%	1.80%	1.92%	1.90%	1.99%
Liquor tax	10,661.85	10,947.24	12,029.51	13,600.15	13,372.71
proportion	4.79%	4.12%	4.64%	4.95%	4.79%
Excise tax	19,160.41	23,933.50	16,362.52	23,429.68	28,764.81
proportion	8.61%	9.00%	6.32%	8.53%	10.31%
Forestry fee	42.43	16.92	18.97	21.73	24.05
proportion	0.02%	0.01%	0.01%	0.01%	0.01%
Mineral royalty fee	1,438.69	2,039.25	1,941.40	1,742.99	2,117.19
proportion	0.65%	0.77%	0.75%	0.63%	0.76%
					0.85%

Type of Revenue	2012	2013	2014	2015	2016	2017
Petroleum royalty fee proportion	4,102.03 1.84%	5,106.05 1.92%	4,959.27 1.91%	3,541.07 1.29%	2,411.94 0.86%	2,335.22 0.77%
Revenue under the National Park Law proportion	77.93 0.04%	20.22 0.01%	45.14 0.02%	43.51 0.02%	57.97 0.02%	100.15 0.03%
Juristic act and right registration fee proportion	26,456.18 11.90%	33,012.43 12.41%	33,214.34 12.82%	36,927.33 13.44%	28,137.94 10.09%	35,852.94 11.86%
Miscellaneous revenue proportion	484.61 0.22%	288.93 0.11%	353.34 0.14%	456.44 0.17%	492.60 0.18%	560.24 0.19%
Total proportion	222,410.77 100.00%	265,909.21 100.00%	259,018.10 100.00%	274,820.28 100.00%	279,004.34 100.00%	302,333.41 100.00%

Source: Ministry of Interior. Department of Local Administration (2017)

3.2.4 Subsidized Grants

Subsidized grants are considered an important income source for Thai local government organizations. The criteria for the allocation of grants and the guideline for specific grant spending are announced annually. According to Table 3.12, from 2012-2015 the number of allocated grants constantly increased. However, from 2016-2017, there was a decrease in the number of grants allocated to all types of local government organizations, except for Bangkok. In 2017, the grants totaled 238,744.44 million Baht. The TAO received the highest amount with 108,441.59 million Baht (45.42%), followed by the municipality, with 90,400.82 million Baht (37.87%). It should be noted that the number of grants allocated to the TAO, municipality, and PAO decreased from 2016-2017.

Table 3.12 Grants by Type of Local Government Organizations

Unit: Million Baht

Type of Local Government Organizations	2012	2013	2014	2015	2016	2017
PAO	24,424.11	23,374.81	20,861.47	25,414.58	24,270.15	19,905.90
proportion	11.35%	10.57%	9.30%	9.78%	9.84%	8.34%
Municipality	72,764.55	84,993.42	86,367.54	99,347.36	93,225.04	90,400.82
proportion	33.82%	38.44%	38.52%	38.24%	37.78%	37.87%
TAO	96,240.90	97,181.05	101,251.71	118,005.85	111,090.80	108,441.59
proportion	44.73%	43.95%	45.15%	45.42%	45.02%	45.42%
Pattaya City	1,535.09	1,473.28	1,492.68	1,498.78	1,615.49	1,582.17
proportion	0.71%	0.67%	0.67%	0.58%	0.65%	0.66%
BKK	20,183.42	14,110.54	14,264.60	15,521.41	16,544.16	18,413.96
proportion	9.38%	6.38%	6.36%	5.97%	6.70%	7.71%
Total	215,148.07	221,133.10	224,238.00	259,787.98	246,745.64	238,744.44
proportion	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Ministry of Interior. Department of Local Administration (2017)

Table 3.13 shows that total grants decreased due to the reduction of specific grants; from 125,959.82 million Baht in 2012 to 22,518.90 million Baht in 2017, with the lowest proportion of 9.43% of total grants, while the number of general grants continued to increase. The decrease in specific grants and the increase in general grants reflected greater autonomy in administration during this period, in line with the principles of decentralization. That is, local government organizations could use the general grants to serve the needs of local people in an independent way, unlike the specific grants which restricted terms and conditions for spending.

Table 3.13 Subsidized Grants Allocated to Local Government Organizations

Unit: Million Baht

Type of Grants	2012	2013	2014	2015	2016	2017
General grants	89,188.25	106,472.75	124,105.98	157,145.13	182,583.63	216,225.55
proportion	41.45%	48.15%	55.35%	60.49%	74.00%	90.57%
Specific grants	125,959.82	114,660.35	100,132.02	102,642.86	64,162.02	22,518.90
proportion	58.55%	51.85%	44.65%	39.51%	26.00%	9.43%
Total grants	215,148.07	221,133.10	224,238.00	259,787.99	246,745.65	238,744.45
proportion	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Ministry of Interior. Department of Local Administration (2017)

CHAPTER 4

LITERATURE REVIEW

This chapter discusses the concepts and theories related to fiscal decentralization and economic growth. The contents of the chapter are organized and presented as follows: Part 1 explains the definition of decentralization and fiscal decentralization. Part 2 demonstrates the concepts and principles of decentralization. The first two parts provide a basic understanding of the principles, advantages and disadvantages, and background of fiscal decentralization. Part 3 describes the assignment of local government expenditure, which is associated with defining clear roles and responsibilities of local government organizations and central government that are helpful for enhancing administrative stability and reducing decentralization conflicts. Part 4 explains the assignment of local government revenue, which is relevant to defining the sources of income essential for fulfilling public service duties of local government organizations. Part 5 presents the concept of government grants that the central government provides to local government organizations as a fiscal tool for policy implementation. Government grants can be divided into unconditional and conditional grants. Part 6 concerns fiscal decentralization and economic growth, including the development of fiscal federalism, which is a cornerstone of the understanding of fiscal decentralization and economic growth.

4.1 Definitions of Decentralization and Fiscal Decentralization

Suphachasai et al. (2002) states that decentralization is a broad term, referring to the transfer or allocation of powers and public duties from the central government to local government organizations, or other independent organizations in the public and private sectors. Each country applies different decentralization models and measures. The coordination between the central government and local government

organizations, as well as the scope of decentralization, also varies in different countries. For example, some countries may use a mild decentralization policy by decentralizing the decision-making power, administrative duties, and financial management responsibilities to local government organizations under the supervision of the central government.

Some countries may apply a strong decentralization approach by decentralizing the decision-making power, administrative duties, and financial management responsibilities to semi-independent organizations governed by locally elected administrators. These semi-independent organizations have the power to make decisions regarding local administration, income generation, and budget spending on their own. Regardless of what approach is used, Rondinelli (1999) stated that decentralization must consist of the following key components: political decentralization, administrative decentralization, and fiscal decentralization.

Fiscal decentralization is defined as the transfer of decision-making power regarding policy implementation, including revenue and expenditure management, from the central government to the local government. The local government's locally elected administrator is allowed to formulate a policy to satisfy the needs of local people because he/she is closer to the local people and understands their needs more than the central government (Chaihad, 2002).

Theoretically, fiscal decentralization has an effect on the macroeconomic system in terms of stability, equity, and efficiency. The details are as follows:

Stability: fiscal decentralization is associated with the improvement of the macroeconomic management system, which aims to reduce the impacts of policy implementation failures and external shocks and depends on the strength, efficiency, transparency, and accountability of each local government organization.

Equity: as people have the right to vote for local administrators, who respond to their preferences, elected administrators must use their abilities to provide public services to the local and poor people that voted for them. This mechanism will help to improve the distribution of income, generate maximum benefits for society, create horizontal and within-locality equity, and allocate resources from the rich to the poor in local areas.

Efficiency: decentralization leads to more efficient allocation of resources compared to centralization. This is because local government organizations have a close relationship with local people so they can utilize the allocated resources to respond to the needs of local people better than the central government. In addition, decentralization can create competition among local government organizations. People have the right to “vote with their feet”. Therefore, decentralization drives local government organizations to compete with each other in producing better public products and services for local people.

Chaihad (2002) suggests that although fiscal decentralization has many advantages, its effects on each local area vary based on the following conditions.

- 1) The administrator of the local government organization must be locally elected. If the local administrator is selected by the central government, he/she will focus on meeting the needs of the central government rather than the needs of local people.

- 2) Local government organizations must have a certain degree of power to manage local tax. In other words, the local government organization must be able to change and adjust local tax revenue and expenditure in order to effectively provide public services that meet the needs of local people.

- 3) Local government organizations must be accountable if the management of local revenue and expenditure is not carried out as announced to the public.

- 4) Local government organizations must have sufficient power to determine the service level of its public service provision.

- 5) Local government organizations must have sufficient ability to collect tax from certain sources as assigned.

At present, the advantages and disadvantages of centralization and decentralization are still debated. The advantages of centralization are that it enables the government to eliminate external effects through internalizing externalities, creates economies of scale in public service provision, and leads to better fiscal policy coordination. In other words, centralization contributes to greater efficiency in resource allocation. In the political dimension, centralization helps to maintain the power of the central government over local government organizations, resulting in

effective administration, unity of governance and a shift of focus among local people from their local interest to the common good.

Moreover, there is the opinion that fiscal centralization can contribute to a country's equality more than fiscal decentralization, as fiscal decentralization enables some local government organizations able to collect more tax and become richer than others. The central government can reduce inequality in the taxation system and the provision of public services by allocating the tax revenue from high-income local government organizations to low-income local government organizations in order to achieve the equal distribution of economic development.

However, despite the advantages mentioned above, centralization can cause the inefficient allocation of resources and a lack of public participation. Fiscal centralization makes all spending decisions solely depend on the central agency. If the management of that central agency uses its political power to allocate budget for its own benefits, it will significantly affect the redistribution of income between individuals and localities.

4.2 Concepts and Principles of Fiscal Decentralization

The concept of fiscal decentralization has recently gained much attention, especially among developing countries. According to Smoke (2001), the reasons behind this phenomenon is as follows: 1) central economic planning models that were once successfully implemented in developing countries face various local problems, exceeding the ability of the central governments to resolve; 2) central governments face large budget deficits and have borrowed large sums of money and therefore the transfer of some duties to local government organizations is required; 3) people are receiving higher levels of education, are more politically aware and are aware of the problems of centralization, resulting in the need for political reform and greater decentralization.

The emerging trend of fiscal decentralization has led to the review of duties and responsibilities of the central government and local government organizations, which may differ depending on the methods and degree of decentralization, including economic, cultural, and political conditions in each country. However, the main goal

of fiscal decentralization is to give local government organizations the ability and freedom to earn income and to obtain sufficient government support in order to perform their duties as assigned.

In many developing countries, including Thailand, local government organizations usually have low tax collection power and a narrow income base. Therefore, they need to rely heavily on subsidized grants from the central government and lack ambition to seek their own income. This affects the success of fiscal decentralization because the subsidized grants from the central government come with strict conditions and spending directives.

Thus, during a period of transition, developing countries need to design appropriate fiscal decentralization policies by considering various factors that can affect efficiency. Laovakul (2012) proposed that the key elements of fiscal decentralization consist of the following:

- 1) A suitable environment conducive to decentralization, such as a legal framework focusing on the rights, duties, responsibilities, and freedom of local government organizations, political determination, minimal bureaucratic friction, and public understanding.

- 2) An appropriate expenditure assignment among the central government and local government organizations that clearly defines the role of each party and specifies the appropriate expenditure of local government organizations based on the finance-follows-function rule.

- 3) An appropriate revenue assignment for local government organizations is needed for fiscal capacity development. Local government organizations must have fiscal independence to spend their revenue as they choose. However, local government organizations may experience various problems in revenue collection, for example, the assigned revenue may not be sufficient to meet spending needs, the assigned source of revenue has low potential unworthy of the cost of collection, and the local administrators' may lack of motivation to collect tax due to the fear of losing political popularity.

- 4) A fiscal transfer system between various levels of government must consider the duties of local government organizations. This is because the budget that local government organizations require to perform their duties may be

higher than their existing income, resulting in a budget gap between income and expenditure. Therefore, fiscal transfer systems should be appropriately designed in order to provide local government organizations with sufficient budgets to perform their duties and to respond to the needs of local people.

5) Opportunities for local government organizations to access funding sources, including loans and bonds. The government budget alone may not be sufficient to implement long-term projects that require large investments. Therefore, providing local government organizations with opportunities to access other funding sources is a way to enhance their fiscal capacity and ability to provide public services to local people.

4.3 Assignment of Local Government Expenditure

Assigning expenditure responsibilities to the government at all levels is the first and most important step in designing the relationships between the central government and local government organizations (J. Martinez-Vazquez, 1999). If the expenditure responsibilities of the central government and local government organizations are not clearly specified it may lead to instability and conflict in decentralization. The most important issue is the overlap of spending decision-making power which makes it difficult to identify the responsibilities of each party and may result in a waste of budget and unworthy spending. The assignment of expenditure responsibilities can be divided into two approaches as follows:

1) The subsidiarity principle, which states that government services should be provided at the lowest level of government with close relationships with local people. Higher-level government organizations should be provided with public service duties that are beyond the capabilities of local government organizations;

2) The residual principle, which specifies that most government services should be provided by the central government. This principle is the opposite of the subsidiarity principle because it emphasizes that local government organizations should be responsible for only specific duties or residual duties that the central government cannot perform;

Bahl and Martinez-Vazquez (2006) suggest that the key principle of mission assignment is creating a system of fiscal decentralization in accordance with the duties and missions of local governments. As budget should be balanced with duties, the clear identification of the local government duties and missions is a critical factor for the success of fiscal decentralization.

The assignment of responsibilities to local governments is the starting point for decentralization. It must be carried out in parallel with expenditure planning in order to achieve consistency and balance between local government revenue and expenditure. If the revenue of the local governments is not sufficient to perform the assigned responsibilities, it is a signal which indicates that there is a need to find additional sources of income and therefore have legitimacy to ask for subsidized grants from the central government.

Varanyuwattana (2013) proposes criteria for the assignment of responsibilities to local government organizations, as follows:

- 1) Efficiency and effectiveness: local government organizations with the closest relationships to the problem or local people should be the public service provider because it would better understand the background of the problem and knows how to utilize resources to solve the problem in a more efficient and effective way compared to other organizations outside the area. Under this approach, known as the subsidiary principle, the responsibilities and decision-making powers of the central government and local government organization are clearly identified.

- 2) Externalities: the assignment of responsibilities should make the public service provisions of the local government organization directly respond to the needs of local people and be able to solve their problems without causing externalities by taking into account both local benefits as well as external costs and benefits.

- 3) Decentralization: the assignment of public service responsibilities to the smallest local government organization that is close to the local area and better understands the local problem should be carried out in accordance with principles of decentralization, which allows all local government organizations to perform duties based on their own capabilities.

4.4 Assignment of Local Government Revenue

In order to fulfill the assigned responsibilities, it is necessary for local government organizations to have financial resources for the production of public products and services. They need to have sufficient revenue, especially from local sources of income or taxation, in order to independently operate public services according to the needs of local people. In addition, when local government organizations have their own sources of income, it will help to enhance accountability among local administrators and local people.

Fiscal decentralization should not only focus on enabling local government organizations have gain revenue without paying attention to accountability, efficiency, and effectiveness, as this can lead to overall fiscal deficit and economic instability at the national level. However, if local government organizations have insufficient revenue, it will negatively affect both the central government and local government organizations themselves. Local government organizations will not be able to maintain their fiscal independence because they will have to rely on the central government's revenue collection and budget allocation. They will need to wait for money from the central government without having any decision-making power regarding the provision of public services. At the same time, the central government has the burden to provide financial support to local government organizations in the form of shared tax revenue and subsidized grants, which leads to budget constraints and increased fiscal risks.

Fiscal decentralization should be appropriately implemented in order to be used as a tool to enhance the fiscal strength of local government organizations and to monitor the central government's operation regarding local government support. Varanyuwattana (2011) suggests that local government organizations should have their own source of revenue for the following reasons:

- 1) Accountability; this is built among local government organizations and reflects the needs and benefits of people in each local area. It also reflects local government organizations' revenue management ability, contributing to greater fiscal independence and better spending efficiency.

2) Reduction in reliance on government grants. When local government organizations have greater power to seek income, they will develop higher efficiency in revenue collection and greater fiscal self-reliance. This will reduce the importance of government grants, especially specific grants that are not in line with the missions of local government organizations.

3) Freedom. Local government organizations will gain more freedom in budgeting, and the provision of public services suitable for the current economic and social conditions and the needs of local people. Thus, local administrators must be able to determine appropriate revenue and expenditure for delivering public services in local areas.

4) Effective revenue management and the creation of greater awareness of public service capacities. Since local government organizations have to rely more on their own revenue, their management visions may change along the way.

Laovakul (2012) states that local government revenue assignments must place an emphasis on local government organizations' locally levied revenue because it is an important mechanism for promoting citizen participation in public service provision. This is because, in theory, local people should jointly bear the cost of public service provision. In addition, public service provision is not the sole duty of local government organizations. Both local government organizations and local people have to participate in public service provision according to the principles of fiscal decentralization, as follows;

1) Local sovereignty: when local government organizations have their own source of revenue, which comes from local taxation, they have the right to make decisions on local tax bases and rates. They have greater fiscal independence than when they have to rely on subsidized grants, which are uncertain and controlled by the central government. Moreover, as they are authorized by law to collect revenue in their responsible areas, they can earn marginal revenue apart from the revenue allocated by the central government. Local government organizations can also determine local tax rates in addition to the surcharge tax rates set by the central government in order to earn sufficient revenue for public service spending. In addition, the adoption of the principle of subsidiarity in taxation gives each local government organization greater fiscal power and the ability to collect more revenue

from other tax bases, which can reduce the vertical imbalance among local government organizations.

2) Accountability and tax competition: a conceptual theory with no practical applications, suggests that tax competition arises from local government organizations' ability to determine their own revenue collection. When the tax burden of the people in each area is different, tax competition among local government organizations is created. Therefore, the central government has to oversee and ensure that each local government organization does not have too much autonomy in determining income structure and tax rates. However, tax competition is a mechanism to prevent the exploitative behavior of local administrators, to enhance accountability in local revenue collection, and to drive local government organizations to improve their operational efficiency in accordance with the amount of tax collected from local people.

3) Benefit principle and revenue assignment: local administrators must find ways to earn revenue from the specific benefits of local people because they have the legitimacy to collect taxes from specific benefits more than general benefits. It is appropriate to collect taxes based on the benefit principle because those that receive greater benefits should bear a greater tax burden than those that receive no or fewer benefits.

Normally, the locally levied revenue of local government organizations is not sufficient to cover the cost of public service provisions because of various factors, such as an insufficient local tax base and lack of revenue from public service fees. Local government organizations still need to rely on shared tax revenue and subsidized grants from the central government. Thus, when implementing fiscal decentralization, it is important to pay attention to subsidized grants as well.

4.5 Concept of Grants

A grant refers to a sum of money provided by one level of government to another level of government. In general, a grant is given by higher-level governments to lower-level governments, for example, a grant provided to the local government by the central government. Government grants are very important because they are

considered a major source of income for local government organizations, apart from locally levied revenue and shared tax revenue. In addition, government grants can be used as an economic tool to reduce the vertical and horizontal fiscal imbalance between the central government and local government organizations and among local government organizations themselves in order to enable local government organizations to provide some public products and services and to motivate local government organizations to comply with government policy.

Government grants are one factor affecting the success of fiscal decentralization. Grant allocation procedures vary according to the context and socio-economic structure of each country. However, the main goal of grants is to create a fiscal balance and to reduce conflict between the fiscal targets of the central and local governments (Boadway & Anwar, 2007).

Government grants should be used to create a fiscal balance between the central and local governments in order to mitigate the problem of the central government having greater income than necessary expenditures, often found in centralized countries more than decentralized countries. Clear conditions for grant spending should be set in order to ensure that each local government adheres to the objectives of the grants provided by the central government.

Boadway and Anwar (2007) classifies the objectives of grants into three categories, as follows:

- 1) Closing the vertical fiscal gap: based on the decentralized approach, local government organizations understand the needs of local people better than the central governments. Therefore, expenditure decentralization should be carried out by driving local government organizations to achieve cost-effective public service provisions through policy competition among local politicians and yardstick competitions; creating a governance mechanism to deal with local monopolies. Decentralization helps to reduce agency problems because local people can demonstrate their needs through voting or moving to another area with local policies that better satisfy their preferences. This is why many countries have attempted to promote decentralization policies.

In terms of revenue decentralization, local government organizations are authorized to earn their own revenue to cover expenses incurred locally, which

helps to enhance overall tax management efficiency. However, giving autonomy to local government organizations may result in inefficiency and inequity. Inefficiency may arise when local government organizations spend too much or too little until distortions affecting externalities are caused. Inequity may occur under fiscal policy competition, which causes changes in the composition of the population. Moreover, differences in the capabilities of each local government organization can also lead to fiscal inequity. Tax harmonization is a way to mitigate effects that may arise from revenue decentralization by harmonizing the diversity of fiscal policies of local government organizations and finding common goals, such as equity and stability, in order to eliminate or avoid tax distortion and to enhance the efficient allocation of resources.

In short, government grants are determined based on the difference between decentralization of expenditure and revenue-raising responsibilities. However, some vertical fiscal gaps can occur because optimal fiscal gaps have not been properly defined.

2) Equalization: the decentralization of revenue and expenditure based on the ability of each local government organization means some local government organizations are unable to provide public services equivalent to the amount of collected tax revenue. This is because each local community has different public service needs and costs due to differences in population composition. Moreover, each local government organization uses different tax bases and rates, resulting in different net fiscal benefits. These differences can lead to inefficiency and inequity problems.

One of the causes of inefficiency is the migration of local people from one community to another community that provides greater net fiscal benefits, leading to inefficient allocation of labor across regions. However, if local people do not migrate and live in their original community, horizontal inequity may occur among local government organizations.

Therefore, one objective of government grant provisions is to prevent the migration of local people based on net fiscal benefits and the horizontal inequity resulting from differences in fiscal capabilities among same-level local government organizations. Diverse fiscal policies should be used to enhance an equal level of

public services and tax rates in order to increase efficiency in labor allocation and horizontal equity among local government organizations.

Government grants are considered a fiscal tool used to create efficiency and equity. In a net equalization system, the tax revenue of high-potential localities should be allocated to lower-potential localities in the form of government grants. This system may be difficult to implement because grants may be used for other purposes. In that case, the central government can equally allocate more grants to each local government organization for public service provisions. This approach is known as the gross equalization system.

3) Achieving national objectives: in addition to the goal of creating efficiency and equity for local government organizations, there are other objectives that the central government needs to consider, including:

(1) Maintaining public service standards in education, public health, and social welfare: in order to ensure that people in each local area are provided with standardized services, the central government needs to create a balance between giving local government organizations the freedom to operate public services and maintaining service standards. One possible solution is setting public service standards and imposing non-compliance penalties. Another solution that is more flexible is allocating conditional block grants to support the provision of necessary public services. The formula for grant allocation must be clearly defined in order to confirm transparency and predictability.

(2) Harmonizing policies to avoid distortions in cross-border transactions, reduce compliance costs, and mitigate externalities. It is the duty of the central government to coordinate policies in order to reduce possible impacts and to allocate budgets for the provision of education, public health, and social welfare in order to ensure that each local government organization is able to provide public goods and services at the same standards.

(3) Preventing inefficiency in the internal economic union. Inefficiency may arise when local government organizations implement fiscal policies that distort cross-border transactions and cause fiscal externalities and discrimination. Therefore, the central government must try to minimize distortions that may occur

through the implementation of harmonization policies in order to promote domestic economic efficiency.

The allocation of government grants to local government organizations is part of the fiscal relation system, which varies according to political context and the historical context of each country. Therefore, when designing the fiscal relationship between the central government and local government organizations, it is necessary to take account the inter-jurisdictional transfers, conditional and conditional grants, tax harmonization, and cooperative agreements among governments. This is to ensure greater efficiency and equity in fiscal decentralization.

Boadway and Anwar (2007) proposes suggestions for the design of government grants as follows:

1) Federal-Regional Equalization Grants

Government grants should enable local government organizations to have equal fiscal capacity to provide standardized public services, to recognize the importance of public service efficiency and equity and to harmonize their policies based on the concept of providing comparable levels of public services at comparable tax rates. This concept can be used in various contexts, covering the following: 1) To increase the revenue-raising capacity of local government organizations in providing public services that may differ according to the needs of each target group but which should be under the same standards, and; 2) to promote the equalization of expenditure among local government organizations with different public service needs and costs.

2) Federal-Regional Conditional Grants

Conditional grants should be used to protect policies that negatively affect domestic economic performance or obstructing the achievement of national equity objectives. In addition, conditional grants should be used to allow local government organizations to implement certain policies in specific areas, such as public health and social welfare. The terms and conditions and financial inducements of conditional grants, including block grants and specific grants, should be clearly determined by the central government based on suitability. Importantly, the allocation of conditional grants to local government organizations must be transparent in order to avoid mistrust and suspicion. In addition, the allocation of grants by the central

government should not interfere with the internal administration or decision-making of local government organizations because it may negatively affect the implementation of decentralization policies as well as the motivation of the organizations to develop their own administrative innovations. Thus, the allocation of grants requires policy harmonization between the central government and local government organizations.

In the next section, the discussion of grants will be contextualised under the assumption that each local government organization seeks to obtain maximum utility as every individual does according to neoclassical microeconomic theory. Understanding the characteristics and impact of each type of grant on the performance of local government organizations is useful in providing appropriate grants to each local government organization. Government grants can be divided into two main types as follows:

1) Unconditional Grants

An unconditional grant is a grant that local government organizations can independently use without any conditions or restrictions. It is the most decentralized type of grant because it provides local government organizations with complete spending freedom.

In Figure 4.1 the AB line represents the budget of local government organizations. If the organization spends all of its budget on producing health services, the maximum amount must not exceed the OB unit. If the local government organization spends all of its budget on producing other public goods, the maximum amount must not exceed the OA unit. IC_0 is the indifferent curve under the set budget. The locally elected administrator, who wants to provide public goods and services that meet the needs of local people, can produce health services at an OX_0 unit and other public goods at an OY_0 unit. When the central government provides unconditional grants to the local government organization, the budget line shifts from AB to CD (income effect) and touches the local satisfaction line, which shifts from IC_0 to IC_1 . As a result, the local administrator will be able to increase the production of health services and other public goods to the OX_1 unit and OY_1 unit respectively.

The provision of unconditional grants allows the local government organization to gain higher income without affecting the production cost of public

goods and services (no price effect). Unconditional grants will be combined with other revenue sources of the local government organization, before being used according to the objectives of that organization.

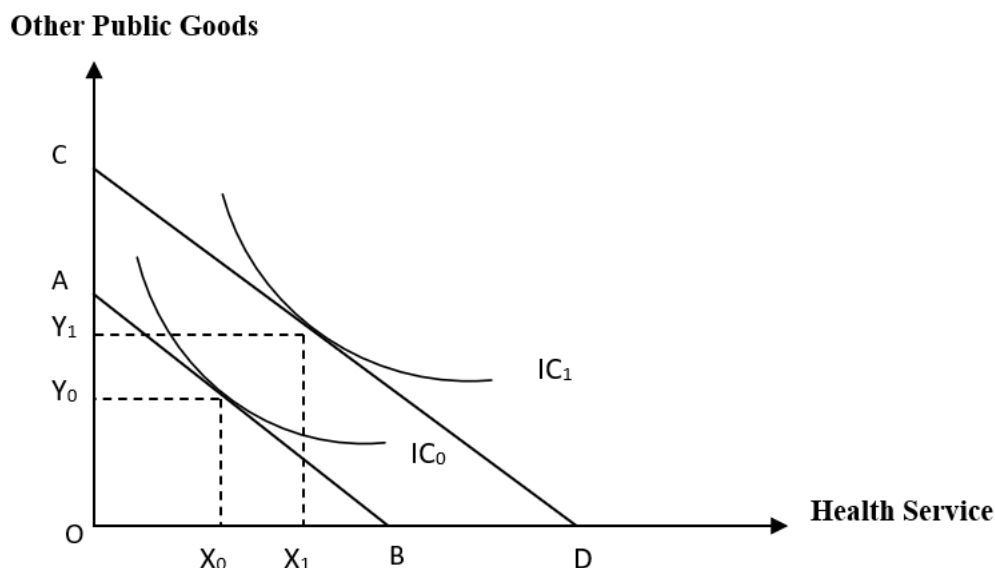


Figure 4.1 Effect of an Unconditional Grant

An unconditional grant is suitable as a tool to solve vertical imbalances between central and local government organizations. The central government can also allocate unconditional grants to local government organizations that have insufficient revenue to cover their expenses in order to solve horizontal imbalances and enhance fiscal equalization among local government organizations.

2) Conditional Grants

A conditional grant is a grant provided to local government organizations under strict spending conditions. A conditional grant can be divided into three main groups according to the conditions set by the central government. Details are as follows:

(1) Block Grants

A block grant is a lump-sum grant provided to local government organizations under broad conditions. Local government organizations are required use the allocated block grants to operate public services according to specified conditions.

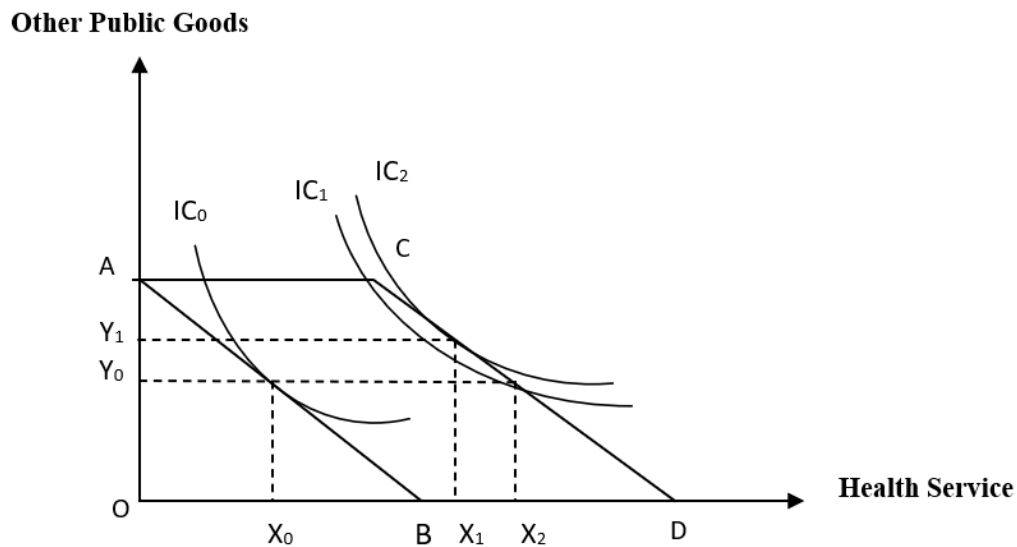


Figure 4.2 Effect of a Block Grant

According to Figure 4.2, AB is the budget line of the local government organization before receiving a grant. The local administrator can produce health services at the OX_0 unit and other public goods at the OY_0 unit. Local satisfaction is at IC_0 . When the local government organization receives block grants at the AC unit, the budget line shifts to ACD with a bend at point C and the local government organization must produce health services of not lower than an AC unit or X_0X_2 unit. However, in practice, the local administrator does not need to produce health services equivalent to the amount of allocated grants, as it can lead to excessive production. The local administrator can alternatively increase the production of health services to the X_0X_1 unit and then use the remaining budget to generate other public goods at the Y_0Y_1 unit. By doing this, the satisfaction of local people will shift to IC_2 .

Block grants combine the advantages of general and specific grants. Local government organizations have a certain level of freedom to make their own spending decisions, while the central government can set a spending framework to encourage local government organizations to produce public services in accordance with government policies. Therefore, block grants are a suitable tool to motivate local government organizations to produce public services based on their own decisions and to comply with government policies at the same time.

The disadvantage of block grants is that local government organizations cannot use them to seek maximum utility, which is different from general grants. In addition, block grants can cause local government organizations to pay less attention to the quality of public services.

(2) Project Grants

A project grant is similar to a block grant except that it comes with more specific conditions. Therefore, this type of grant is less centralized than unconditional and block grants. Local government organizations receiving project grants need to provide public services according to the specified conditions of each project. Due to specific and detailed conditions, local government organizations cannot use project grants to operate other public services, although they can better serve the needs of local people.

Figure 4.3 shows how local government organizations receive a project grant at the AC unit for increasing the number of doctors to provide services to local people, the budget line shifts from AB to ACD. The local government organization needs to increase the number of doctors to the X_0X_1 unit according to the specified conditions. As a result, the satisfaction of local people will shift up from IC_0 to IC_1 . However, the local government organization cannot use the allocated project grants to carry out other activities, although those activities can make local people more satisfied. The local government organization can only produce public services according to the requirements set by the central government.

Project grants can reduce the marginal cost of local government organizations in the production of public services to zero. In other words, project grants make it so that local government organizations have no production cost in providing public services according to the central government's requirements. Thus, the central government can use project grants to motivate local government organizations to produce public services that are beneficial to the public at acceptable standards.

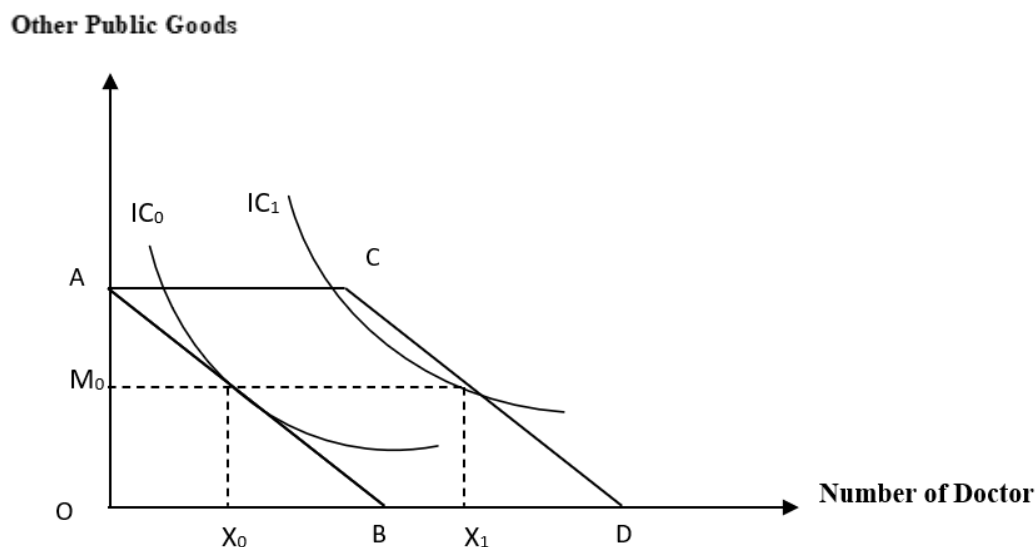


Figure 4.3 Effect of a Project Grant

(3) Matching Grants

A matching grant is a grant provided to local government organizations on the condition that the recipient must pay contributions according to the proportion set by the central government in order to reduce marginal costs in the production of public services. If the contribution proportion is set at 1:1, the production cost of each public service unit will be cheaper by 50%. This type of grant motivates local government organizations to increase the production of specific public services. Thus, matching grants can be used as a tool to correct for positive externalities and to encourage local government organizations to provide public services that are beneficial to the public as a whole. The contribution proportion should be determined by considering both local and public benefits. Matching grants can be classified into open-ended matching grant and the closed-ended matching grant.

The open-ended matching grant is an unlimited grant provided to local government organizations for the provision of specific public services. This type of grant makes the production cost of public services cheaper than that of other goods and services (price effect) because the central government will pay contributions to local government organizations for every unit produced, which helps to reduce the expenditure burden of local government organizations.

Other Public Goods

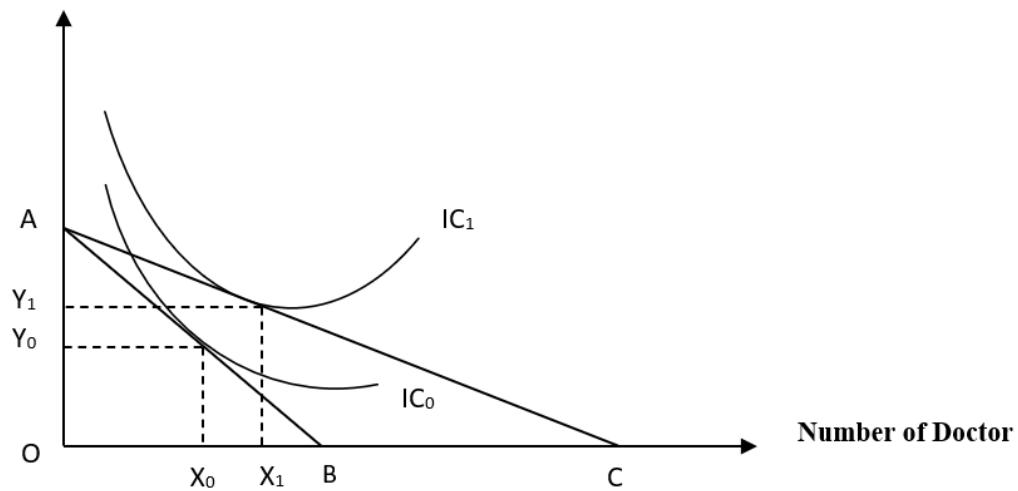


Figure 4.4 Effect of an Open-ended Matching Grant

According to Figure 4.4, before receiving grant, the budget line of the local government organization is AB. The local government organization can produce health services at the OX_0 unit and other public goods at the OY_0 unit. When the local government organization receives an open-ended matching grant to employ doctors, the employment cost is reduced, compared to relative prices. The budget line shifts to AC and touches the local satisfaction line at a higher level. If the local government organization uses its own budget to employ doctors at the OB unit, the central government will provide more grants at the BC unit. After receiving the grant, the local administrator can respond to the needs of local people by producing health services at the OX_1 unit and other public goods at the OY_1 unit.

The advantage of the opened-ended matching grant is that it can motivate local government organizations to increase the production of some public services by causing them to share the cost of every unit produced. It can encourage local government organizations to increase their revenue collection capacity as well. The disadvantage of this type of grant is that it requires local government organizations to pay contributions to the project, which may result in the misuse of the local government budget and cause injustice to low-income local government organizations that have no chance to receive this type of grant due to a lack of money to pay contributions.

The closed-ended matching grant is a grant provided to local government organizations based on a specified limit in order to reduce the cost of public services. If the production of public services exceeds the specified limit, local government organization must be responsible for the excess cost.

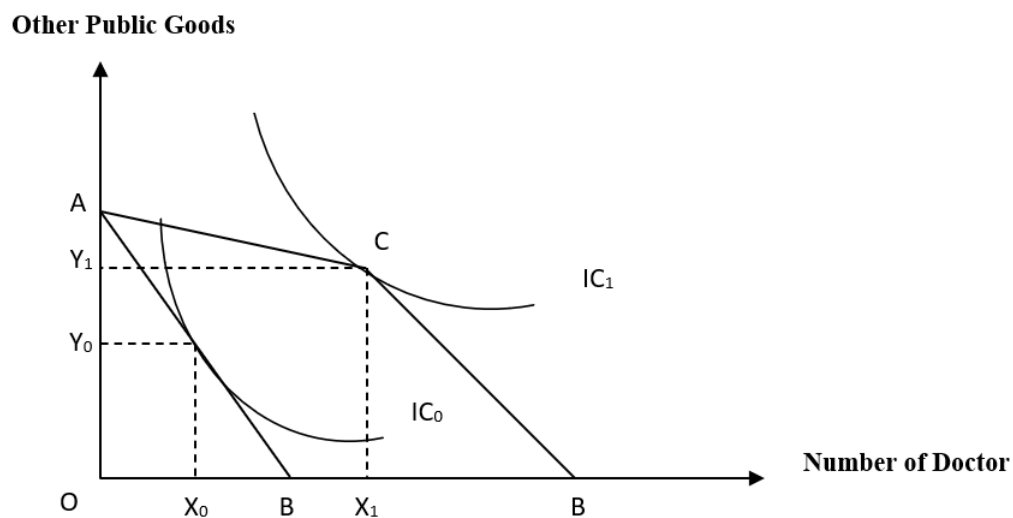


Figure 4.5 Effect of a Closed-ended Matching Grant

According to Figure 4.5, the original budget line of the local government organization is AB. The local administrator employs doctors at the OX_0 unit and produces other public goods at the OY_0 unit. Then the government provides a closed-ended matching grant to employ doctors at the OX_1 unit. If the local government organization wants to employ doctors more than the OX_1 unit, it will not receive additional contributions from the government. As a result, the budget line shifts to ACD. The local administrator can employ doctors at the OX_1 unit and produce other public goods at the OY_1 unit. The satisfaction of local people then shifts from IC_0 to IC_1 .

The provision of a closed-ended matching grants can lead to operational inefficiency because the local government organization will try to produce public services that receive contributions from the central government as much as possible until exceeding the needs of the people in that area. However, the advantage of the

closed-ended matching grant is that it enables the central government to set a grant limit in order to have a sufficient budget for other projects.

4.6 Fiscal Decentralization and Economic Growth

Over the past two decades, the phenomenon of decentralization has spread around the world. Due to various factors, many socialist and democratic countries have been pressured to decentralize their administrative power to local government organizations (Smoke, 2001). One of the key mechanisms of decentralization is fiscal decentralization, which refers to the transfer of budget and resources to local government organizations in order to strengthen local self-responsibility and to promote public participation in public service provision.

The concept of fiscal federalism has undergone constant development. Oates (2005) classified this concept into its first generation and second-generation theories.

First generation theory (FGT) focuses on the role of central government and local government organizations as agents responsible for managing market mechanism failures for the maximum benefit of people. Fiscal decentralization is based on increasing the efficiency of resource allocation, public service provision and the distribution of developments across the country.

FGT specifies that, as local government organizations are aware of the basic needs of local people, fiscal decentralization can enhance the efficiency of public service provisions, indicating a positive relationship between fiscal decentralization and economic development. FGT combines the advantages of centralization and decentralization in order to appropriately determine the duties of central government and local government organizations, including the efficient allocation of resources in order to create more equal income distribution and to maintain high levels of economic growth and employment rates. In theory, the central government should be responsible for stabilizing prices and distributing income because it has more potential to generate a high level of employment under price stability, compared to local government organizations. Moreover, it has greater ability to successfully resolve income distribution problems resulting from labor mobility. On the other hand, local government organizations should be responsible for the allocation of

resources because they have close relationships with local communities and better understand the needs of local people.

FGT supports decentralization for resource allocation optimization. According to the decentralization theorem of Oates (1972), “each public service should be provided by the jurisdiction having control over the minimum geographical area that would internalize benefits and costs of such provision.” Tiebout (1956) suggests that if consumer-voters’ real preferences for public goods are revealed, those public goods will be produced with appropriate tax rates through a political mechanism. Consumer-voters will vote for a local administrator that can satisfy their preference pattern. Fiscal decentralization can increase the efficiency of public service provisions because it will help to facilitate the appropriate distribution of public goods and services. Consumer-voters can choose the type of public goods and services, size of production, and tax rates. However, if they are not satisfied with the voting results, they can relocate to another area that is more suitable for them.

The key difference between centralization and decentralization is that, under centralization, the preferences of local people are determined by the central government. On the other hand, under decentralization, the preferences of local people are determined by themselves through voting. Therefore, FGT emphasizes that fiscal decentralization can improve the efficiency of public service provision. This helps to explain why fiscal decentralization has a positive relationship with economic development, in line with the concept that local government organizations understand the public service needs of local people.

Second generation theory (SGT) is an emerging theory which aims to find appropriate political and fiscal relationships between the central government and local government organizations and to explore the factors motivating their behavioral changes in order to increase efficiency for the maximum benefit of the people. SGT not only places emphasis on decentralization from the top and the allocation of greater resources to local government organizations, but also pays attention to strengthening the power of local government organizations. Therefore, decentralization policies must be carefully designed by considering the efficient allocation of resources and the establishment of a support system and an intergovernmental assessment system.

The differences between SGT and FGT are mainly reflected in the importance they give to political economy; the relationship between the central government and local government organizations based on the motivation of political and fiscal institutions. Oates (2005) states that SGT places importance on the principle-agent problem, which Hayek's ignorance (knowledge) theorem, and the public choice perspective places important on the goals of local public administrators which may differ from the goals of society. SGT can be considered as an attempt to develop a better theoretical framework for fiscal decentralization.

A principle-agent problem results from asymmetric information between the principle (people) and the agent (government), which causes inefficiency, that is, the farther the agent is from the principle, the more asymmetric the information becomes. The decentralization of power to localities can reduce the distance between the principle and the agent, giving the principle more opportunities to assess the performance of local government organizations. This is in line with the bureaucracy theory of Niskanen (1971), which states that there are differences between non-elected policymakers and elected policymakers. Non-elected policymakers intend to respond to central government policy, while elected policymakers focus on satisfying the needs of local people because their satisfaction may affect the next election. Thus, differences in behavior and the objectives of non-elected policymakers and elected policymakers can affect the efficiency of public policy formulation.

Hayek's ignorance (knowledge) theorem emphasizes that knowledge is scattered in different sources and individuals. Knowledge is not accumulated, so it is impossible for an individual or a group to have absolute social knowledge. Thus, knowledge problems can be solved by letting individuals make decisions and act. Based on this principle, local government organizations with a greater knowledge of the needs of local people are able to provide public services in a more efficient way than the central government.

The public choice perspective is concerned with the decisions of public decision-makers based on the utility maximization rule. Fiscal decentralization leads to inter-jurisdictional competition among local government organizations, which is similar to business competition in the private sector. This kind of competition can be considered a mechanism for limiting the monopolistic power of the central

government. Each local public administrator will pursue vote maximization by formulating public service policies that respond to the needs of local people.

In summary, FGT focuses on the relationship between fiscal decentralization and economic growth and the mechanisms for improving the efficiency of public service provision that have an impact on economic growth. On the other hand, SGT aims to explain that the success of fiscal decentralization and economic development is based on the design of the incentive structure, the support system, and the intergovernmental assessment system.

4.7 Concept of Inclusive Growth

Inclusive growth is a development concept that has recently gained much attention from policy makers. The economic growth of many countries has caused various externalities, especially in terms of inequality. Although some economists try to explain the increase in per capita income and economic expansion, this may lead to unequal income distribution in the early stages. However, when the economy expands to a certain level, it will result in decreased income inequality. As the relationship between economic growth and income inequality has a turning point, higher income inequality is acceptable, when a country aims at high economic growth (Kuznets, 1955). However, in reality, economic growth continually leads to increased inequality until it has become a major problem hindering long-term economic development. In addition, several studies indicate that economic development does not require a trade-off between economic growth and equality (Okun, 1975; Persson & Tabellini, 1994).

It is not easy to reduce inequality and create social equity. This is because, in an unequal society, different people own different resources and the people with higher resources tend to disagree with inequality reduction measures because they do not want to lose their resources or social status. Therefore, The World Bank proposed the concept of inclusive growth, which refers to the growth that creates shared benefits and equal opportunities for all groups of people in society.

Inclusive growth does not have a fixed definition. However, many academics have tried to define this term. Anand, Mishra, and Peiris (2013) state that inclusive growth is a concept that advances equitable opportunities for economic participants

during economic growth with benefits incurred by every section of society. Ianchovichina and Lundstrom (2009) suggest that inclusive growth involves a long-term perspective and focuses on generating employment in order to increase the income of excluded groups. Ali and Son (2007) argue that growth with inclusiveness is growth that allows every individual (group) of society to participate in and contribute to the growth process on an equal footing, regardless of their individual circumstances.

Based on the above definitions, it can be summarized that inclusive growth is aimed at enabling economic growth to create as many economic opportunities as possible for all sectors in society, especially the poor, in order to reduce inequality, promote fair income distribution, enhance the participation of the poor in the process of economic development and benefit-sharing. Thus, the core concept of inclusive growth is to create and ensure equal economic opportunities, to build an environment where everyone can equally participate in the growth process, and to provide equal access to public services.

Ali and Son (2007) developed the measurement of inclusive growth from social mobility curves. According to Figure 4.6, two social mobility curves that have the same average income ($\bar{y}$) but different levels of inclusiveness (different income distribution) are presented. The curve A1B has greater inclusiveness than the curve AB because the average income of the bottom segment of the society is higher.

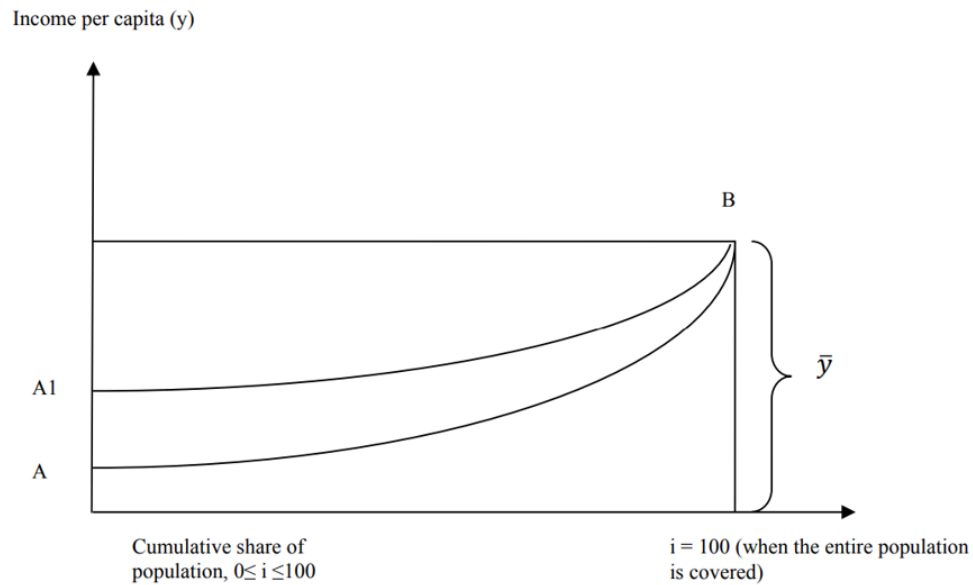


Figure 4.6 Social Mobility Curves

Source: Ali and Son (2007)

In order to find the change in income distribution, an index (or social mobility index) from the area under the social mobility curve is calculated as follows:

$$\bar{y}^* = \int_0^{100} \bar{y}_i di$$

The greater is $\bar{y}^*$, the greater is the income. If the income of all population is the same or the distribution of income is completely equitable, $\bar{y}^*$ will be equal to $\bar{y}$. If $\bar{y}^*$ is lower than $\bar{y}$, it means that the distribution of income is inequitable. Therefore, the deviation of $\bar{y}^*$ from $\bar{y}$ is an indication of income distribution inequality.

Ali and Son (2007) proposed an income equity index (IEI) as follows:

$$\omega = \frac{\bar{y}^*}{\bar{y}}$$

In a completely equal society, ω is equal to 1. The closer the value of ω is to 1, the greater is income equality.

$$\bar{y}^* = \omega * \bar{y} \quad (1)$$

Increasing $\bar{y}^*$, which is required for inclusive growth, can be achieved through (1) increasing $\bar{y}$, i.e. increasing average income through growth, (2) increasing the income equity index by increasing equity, or (3) a combination of (1) and (2).

$$d\bar{y}^* = \omega * d\bar{y} + d\omega * \bar{y} \quad (2)$$

where $d\bar{y}^*$ is the change in the degree of inclusive growth. Growth is more inclusive if $d\bar{y}^*$ is greater than 0. Based on the above equation, inclusive growth can be decomposed into income growth and the change in equity. Income growth is the contribution of increase in average income (keeping income distribution constant). The change in equity is the contribution of changes in the income distribution (keeping the average income unchanged).

Inclusive growth relies on the sign and magnitude of the above two elements. Figure 4.7 depicts all possible combinations of the two elements. If both elements are positive ($d\bar{y} > 0$, $d\omega > 0$), growth is unambiguously inclusive (AB changing to A1B1). On the other hand, if both elements are negative ($d\bar{y} < 0$, $d\omega < 0$), growth is unambiguously non-inclusive (AB changing to A4B4). However, there can be trade-offs between $\bar{y}$ and ω . If the first element is positive but the second element is negative, higher inclusiveness is achieved at the expense of reduction in equity. This case can be demonstrated by the shift of social mobility curve from AB to A2B2. Similarly, if the first element is negative but the second element is positive, higher inclusiveness is achieved at the cost of contraction in average income. This case can be demonstrated by the shift of social mobility curve from AB to A3B3.

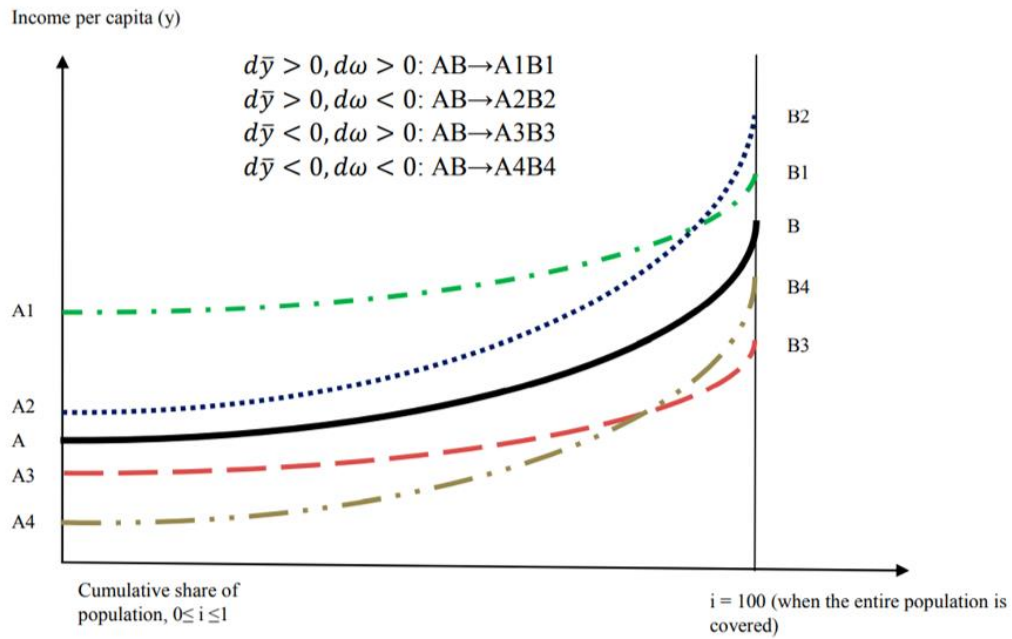


Figure 4.7 Changes in Social Mobility Curve

Source: Anand et al. (2013)

Equation (2) can be arranged as:

$$\frac{d\bar{y}^*}{\bar{y}^*} = \frac{d\bar{y}}{\bar{y}} + \frac{d\omega}{\omega}$$

The basic relationship combining growth and equity into one measurement of inclusive growth (percent change in $\bar{y}^*$). Inclusive growth is decomposed into growth and percentage change in equity, measured by ω . This decomposition is subsequently used to present the development of inclusive growth and the relative contributions of growth and equity. The use of simple social mobility function to calculate an index from the area under the social mobility curve is easy to understand and in line with the absolute definition of pro-poor growth. Different weights can be assigned to growth and equity in order to introduce more subjective dimensions of inclusive growth. The limited gains in inclusiveness are described by relatively low growth and widening disparities. The decomposition of inclusiveness in Equation (2) indicates that there is a wide dispersion of possible outcomes. The four possible scenarios are presented in Table 4.1.

Table 4.1 Inclusiveness Matrix

Value of $d\bar{y}$	Value of $d\omega$	Description
$d\bar{y} > 0$	$d\omega > 0$	Unambiguously inclusive
$d\bar{y} > 0$	$d\omega > 0$	High per capita income at the expense of equity (can be inclusive if the percentage change in $\bar{y}$ is greater than the percentage change in ω (see more details in Equation 3).
$d\bar{y} < 0$	$d\omega > 0$	Equity objective is achieved at the cost of contraction in average income.
$d\bar{y} < 0$	$d\omega < 0$	Unambiguously non-inclusive

Source: Anand et al. (2013)

CHAPTER 5

RELATED RESEARCH

This research aims to study relationships among fiscal decentralization, local government performance and inclusive growth. In order to determine the conceptual framework of the research, related studies of the impacts of fiscal decentralization on economic growth and inclusive growth are explored and classified into four groups, including: 1) related cross-country studies; 2) studies related within the country; 3) related studies conducted in Thailand; and 4) review of research related to inclusive growth. The details of each group are presented below:

5.1 Related Cross-Country Studies

Woller and Phillips (1998) carried out a study on the relationship between fiscal decentralization and economic development in 23 less-developed countries from 1974-1991. The research was undertaken following suggestions made by development experts and economists that decentralization should be used as an economic development tool because decentralization mechanisms enable local government organizations to provide public services that meet the needs of people and help increase the efficiency of economic planning and policy implementation vital to local development. In this study, the panel data method was used to analyze the annual data. The model used to obtain the results is as follows:

$$\gamma = \alpha + \beta_y y + \beta_z z + \beta_x x + \varepsilon(1)$$

Where γ is per capita growth rate, y is a set of 4 baseline regressors, consisting of 1) real income per capita, 2) investment per GDP, 3) size of the population, and 4) educational level; z is the fiscal decentralization measure, comprising both revenue and expenditure decentralization variables, namely 1) the ratio of local government revenue to

total government revenues, 2) the ratio of local government revenue less grants-in-aid to total government revenues, 3) the ratio of local government expenditures to total government expenditures, and 4) the ratio of local government expenditures to total government expenditures less defense and social security expenditures; and x is a set of 8 factors: 1) the ratio of the sum of imports and exports to GDP; 2) the sum of total foreign bank assets and liabilities divided by GDP; 3) the inflation rate based on the implicit GDP deflator; 4) the variance of inflation for the relevant time period; 5) an index of political repression; 6) an index of civil liberty; 7) the value of the real exchange rate; and 8) the log difference of domestic credit.

The results show an inverse relationship between fiscal decentralization and economic development when using the five-year mean of the explanatory variables. However, no relationship between fiscal decentralization and economic development can be seen when using the three-year mean and the annual mean of the explanatory variables. Although the research did not confirm the relationship between fiscal decentralization and economic development, it indicates that fiscal decentralization policies have an effect on the rural and local economic development of less-developed countries.

Jorge Martinez-Vazquez and McNab (2006) research studies the influences of fiscal decentralization on economic growth in 66 high-income and developing countries from 1972-2003. The neoclassical model of economic growth, consisting of the accumulation of human and physical capital variable and the technological progress variable, was used to investigate the influences of revenue decentralization and expenditure decentralization on economic growth. The Cobb-Douglas production function used in this study is shown below:

$$Y_{it} = V_{it} K_{it}^{\alpha} G_{it}^{\beta} H_{it}^{\varphi} L_{it}^{\theta} \quad [1]$$

Where Y is $\alpha, \beta, \varphi, \theta > 0$ and $\alpha + \beta + \varphi + \theta \geq 1$. output, V is technology and other institutional factors, K is stock of the public sector, G is stock of the private sector, H is investment, L is stock of labor, A is technological progress, D is decentralization, and MS is macroeconomic stability.

$$V_{it} = A_{it}D_{it}MS_{it} \quad [2]$$

This research differs from other studies as it covers the analysis of the effects of exogenous factors and includes decentralization as one of these factors, shown in Equation 2.

Results indicate that fiscal decentralization has a positive effect on economic stability in developed countries and the size of the effect is lower in developing and transitional countries. However, the research did not confirm the effect of fiscal decentralization on economic growth in the target countries. In addition, the results show that fiscal decentralization may have a direct effect on economic growth rate-slowdowns in developed countries. In developing countries, no evidence of the direct effect of fiscal decentralization on economic growth is seen.

Rodríguez-Pose and Krøijer (2009) research highlights the effects of fiscal decentralization on the capacity of local governments in order to tailor policies to local preferences. The research also studied the provision of policies and public services and the potential for economic efficiency and growth across 16 central and eastern European countries from 1990-2004. The model used in this study is as follows:

$$y = \alpha + \beta_y x + \beta_z z + \varepsilon$$

Where y stands for the GDP per capita growth rate, x is a set of 6 variables affecting economic growth, comprising 1) population growth, 2) initial level of GDP per capita, 3) ratio of investment to GDP, 4) growth deflator, 5) number of computers per 1000 inhabitants, and 6) human capital accumulation measured by illiteracy; and z is a set of three fiscal decentralization variables: 1) subnational expenditures as a percentage of total expenditures, 2) tax revenue as a percentage of total subnational revenues and grants, and 3) transfers to subnational governments from other levels of government as a percentage of total subnational revenues and grants.

The results suggest a negative relationship between fiscal decentralization and economic growth during the research period when using either the revenue decentralization variable or the expenditure decentralization variable. The transfers to

subnational governments were found to be negatively correlated with economic growth, with no statistical significance. However, the results of this study indicate that a long-term relationship between fiscal decentralization and economic growth relies on clear and transparent decentralization and duty assignment policies, as well as accountability between central and local governments. The major problem was that some transitional countries have weak local government organizations which are not equipped for self-governance.

Bodman (2011) study on the relationship between fiscal decentralization and economic growth in 18 OECD countries from 1981-1998 uses public-sector decentralization variables to reflect subnational governments' abilities to account for local preferences in fiscal decision-making. A number of elected subnational governments were taken into consideration because two countries may have the same subnational share of expenditures or revenues but different numbers of participating subnational governments, and the differences in number of subnational governments may affect the implementation of local fiscal policies and economic growth.

Data was analyzed using the cross-sectional analysis method. The equation used is as follows:

$$\Delta \ln RGDP C_i = \Delta \ln A_i + \alpha \Delta \ln k_i + \beta \Delta \ln h_i \quad (1)$$

Where RGDP C is real GDP per capita, A is efficiency, k is capital per capita, and h is the measure of human capital, which is proxied by the growth rate of the secondary school enrolment ratio. The efficiency (A) was calculated using the following equation.

$$\Delta \ln A_i = Y_{A1}FD_i + Y_{A2}FU_i + \gamma_{A2}FU_i + \gamma_{A3}NSGVT_i + \gamma_{A4}ELECT_i + \gamma_{A5}EMPLOY_i \quad (2)$$

Where FD is revenue and expenditure decentralization, FU is the federalism dummy, NSGVT is the number of subnational government units, ELECT is the number of elected subnational tiers of the government, and EMPLOY is the subnational to central government employee ratio. When combining Equation (1) with (2), the results are as follows:

$$\Delta \ln RGDP C_i = \gamma_{A0} + \gamma_{A1} FD_i + \gamma_{A2} FU_i + \gamma_{A3} NSGVT_i + \gamma_{A4} ELECYT_i \\ + \gamma_{A5} EMPLOY_i + \alpha_1 \Delta \ln k_i + \alpha_2 \Delta \ln h_i \quad (3)$$

The cross-sectional analysis results show that there is no relationship between fiscal decentralization and economic growth. Therefore, an additional test was carried out using the panel data analysis method. The results indicate a relationship between fiscal decentralization and economic growth from 1981-1998. However, the interesting findings of this study is that federally decentralized countries tend to have lower growth rates than unitary centralized countries and that the number of local elections can contribute to the decline of economic growth.

Baskaran and Feld (2013) investigated the relationships between fiscal decentralization and economic growth in 23 OECD countries from 1975-2001. Their study on the decentralization of revenue and expenditure looked at 1) summing all sub-federal tax revenue from taxes, and 2) summing all tax revenue from shared taxes. The conceptual model of Xie, Zou, and Davoodi (1999) was adopted for use in this study as follows:

$$\text{Economic Growth}_{it} \\ = \beta_0 + \beta_1 \text{Decentralization}_{it} + \beta_2 \text{Economic Controls}_{it} + u_{it},$$

In this model, the dependent variable is the growth rate of labor productivity, while the control variables affecting economic growth include the tax to GDP ratio, the growth rate of physical capital by the investment share from GDP, and human capital, which is proxied by the gross enrolment rates in secondary education, population growth, and inflation rates. The results were obtained through pooled OLS, random effects, and fixed effects estimations. The highlight of this study is the use of labor productivity to measure economic growth. In previous research, economic growth was mostly measured by the growth rate of GDP or growth rate of GDPPC.

The results show that fiscal decentralization is not significantly correlated with economic growth. However, it was found that increased decentralization to local governments is a major obstacle to economic expansion reflecting that decentralization planning must pay attention to the political and fiscal autonomy of

lower-level governments. The results also suggest that political autonomy is not beneficial for economic expansion.

Filippetti and Sacchi (2016) explore the relationship between fiscal decentralization and economic growth, stating that previous studies avoided addressing the importance of institutional contributions, which are vital to the relationships between fiscal decentralization and economic growth. Thus, their research aimed to study the relationship between fiscal decentralization and economic growth in different institutional settings in 21 OECD countries from 1970-2010. The data was analyzed using the simple ordinary least squares (OLS) method and pooled cross-section analysis. The equation used is shown below:

$$\Delta GDP_{it} = \alpha_0 + \alpha_1 GDP_{i,t-1} + \beta_1 TD_{it} + \sum_{j=1}^s \gamma_j Cont_{jit} + \tau_t + \varepsilon_i + \mu_{it}$$

The dependent variable is GDP_{it} (log difference in real per capita GDP) of each country. $GDP_{i,t-1}$ is the logarithm of real per capita GDP at the beginning of that period. TD_{it} is fiscal decentralization measured by three types of tax-based revenue: 1) sub-central governments' own tax revenue/general government total tax revenue (TD); 2) sub-central governments' income taxes/general government total tax revenue (TDI); and 3) sub-central governments' property taxes/general government total tax revenue (TDP). The other variables are comprised of population growth, urbanization, unemployment rate, the average years of schooling, the degree of openness, gross fixed capital formation growth, and the ideology of the national political party in office.

In this study, apart from the fiscal decentralization variable, administrative and political decentralization (APD) was also used as a new variable to measure the degree of authority of subnational governments. The regional authority index (RAI) was also included in the analysis model as follows:

$$\Delta GDP_{it} = \alpha_0 + \alpha_1 GDP_{i,t-1} + \beta_1 TD_{it} + \theta_1 RAI_{it} + \lambda_1 (TD_{it} * RAI_{it}) + \sum_{j=1}^s \gamma_j Cont_{jit} + \tau_t + \varepsilon_i + \mu_{it}$$

The results suggest that the effects of fiscal decentralization on economic growth depend on the authority of subnational governments. High tax decentralization leads to higher rates of economic growth when coupled with high administrative and political decentralization. On the other hand, low tax decentralization can lead to lower rates of economic growth when coupled with low administrative and political decentralization.

Ligthart and Van Oudheusden (2017) study on the relationship between fiscal decentralization and economic growth states that most previous research overlooks the fundamental characteristics of each country, such as the legal and political systems, country size, and geographic conditions. They find that countries with similar fundamental characteristics seem to have similar decentralization policies and procedures. Therefore, the researchers introduced new instrumental variables based on the fundamental characteristics of each country under the assumption that countries with similar fundamental characteristics will not only have a similar degree of fiscal decentralization but also use similar decentralization measures.

This research suggests that the measurement of fiscal decentralization should reflect the autonomy of subnational governments. Thus, in this research, fiscal decentralization was measured through three variables, comprised of: 1) expenditures, 2) tax revenue, and 3) tax revenue autonomy, which reflects the autonomy of subnational governments in collecting local tax. This research was carried out in 56 countries from 1990-2007. The results utilised the ordinary least squares method. The model is as follows:

$$g_{it} = \phi f_{it} + \psi' x_{it} + \gamma' z_{it} + \varepsilon_{it},$$

In this model, g_{it} is the growth rate of real GDP per capita of country i at time t , f_{it} is fiscal decentralization, ϕ is parameters, matrix x_{it} is explanatory variables,

matrix z_{it} is additional explanatory variables, ϕ and γ are vectors of parameters, and ε is the error term.

Moreover, the instrumental variables identifying the fundamental characteristics of each country were added to the model as follows:

$$q_{it} = \sum_{j=1}^N \omega_{ij} f_{jt}, \quad \omega_{ij} \equiv \begin{cases} d_{ij} / \sum_{j=1}^N d_{ij} & \text{for } i \neq j, \\ 0 & \text{for } i = j \end{cases},$$

In this model, f_{jt} is the fiscal decentralization of country j at time t , ω_{ij} is weight (0-1), and d_{ij} is the similarity between country i and j .

When testing the relationships among the three fiscal decentralization variables with economic growth, it was found that expenditure was positively and significantly correlated with economic growth, tax revenue was negatively correlated with economic growth, and tax revenue autonomy was positively correlated with economic growth. The results also indicated that using fiscal decentralization variables that better reflect the autonomy of subnational governments can increase the relationships between fiscal decentralization and economic growth.

Based on the above cross-country research, the relationships between fiscal decentralization and economic growth were seen to vary depending on economic and political conditions and the development level of political institutions in each country. Therefore, in order to create a valid relationship model, the researcher further explored the relationships between fiscal decentralization and economic growth in previous studies that employed a within-country research design. The details are presented in the next section.

5.2 Related Within-Country Studies

Xie et al. (1999) tested the impact of fiscal decentralization on the economic growth of the U.S. economy from 1948 to 1994. The variable used to measure fiscal decentralization in this study was the share of spending according to each level of government in consolidated government spending across all levels. The ordinary least squares technique was employed to analyze data. The model equation is as follows:

$$\Delta y_t = x'_t \delta + u_t$$

Where y_t is the logarithm of per capita output, x_t consists of: 1) shares of government spending at different levels (measures of fiscal decentralization), 2) tax rate, and 3) other determinants of growth; δ is the vector of parameters to be estimated; and u_t is the disturbance term. The results of this study showed that fiscal decentralization is positively correlated with economic growth.

Zhang and Zou (2001) study the relationship between fiscal decentralization and economic growth in China. The study aimed to investigate the effect of fiscal decentralization on economic growth in 26 Chinese provinces from 1980-1992. In the late 1970s, the Chinese government implemented policy to allocate greater fiscal resources to local governments, resulting in higher ratios of local government expenditure to total government expenditure. The dependent variable for the study was the provincial income growth rate. The explanatory variables were composed of the following:

- 1) Production inputs, including investment and labor
- 2) Measures of fiscal decentralization of spending
- 3) Measures of the composition of central and provincial budgetary expenditures
- 4) Other variables, such as the tax rate, foreign trade, and the inflation rate

The growth model is as follows.

$$Y_{st} = \beta_m M_{st} + \beta_n N_{st} + \beta_{dc} DC_{st} + u_{st}, \quad (1)$$

Where, M_{st} is a set of variables, comprising: 1) the growth rate in the total labor force (L) and 2) the tax rate that the central and provincial governments collected from province s as of year t . N_{st} is a set of variables, consisting of: 1) degree of openness, 2) inflation rate, and 3) investment rate of province s as of year t .

DC_{st} equals the degree of fiscal decentralization, measured by the following three indicators: 1) the ratio of consolidated provincial spending to consolidated central spending, expressed in per capita terms; 2) the ratio of provincial budgetary

spending to central budgetary spending, expressed in per capita terms; and 3) the ratio of provincial extra-budgetary to central extra-budgetary spending, expressed relative to income.

The results indicate that fiscal decentralization is significantly and negatively correlated with provincial economic growth. The results were found to be inconsistent with the hypothesis, probably due to the fact that the construction of public utilities, such as expressways, railways, and transportation and energy systems, had a greater impact on economic growth. Moreover, the budget for public utility construction was included in central government spending more than provincial government spending. Therefore, the testing results were not in line with the set hypothesis. However, when testing the relationship between central government spending and economic growth, it was found that central government spending was significantly and positively correlated with economic growth.

Jin, Qian, and Weingast (2005) focuses on the theory of market-preserving federalism, emphasizing the importance of government decentralization and incentives on market development. The study covers 29 Chinese provinces from 1982-1992, after the period of economic reform when China had begun to decentralize power to local governments. The research model is as follows:

$$X_{it} = a_i + d'Z_{it} + s'W_{it} + u_{it}$$

Where X_{it} is a vector of variables measuring local economic performance in a province.

a_i is the provincial specific effects (fixed effects).

β_t is the annual dummies, which are intended to capture the effects of nationwide macroeconomic fluctuation.

Z_{it} is a vector of variables measuring fiscal decentralization, bureaucratic integration, and fiscal incentives.

W_{it} is a vector of other variables.

u_{it} is the disturbance term.

The results show that both revenue decentralization and expenditure decentralization are positively correlated with economic growth, which is in line with the theory of market-preserving federalism. In addition, findings indicate that regional decentralization also contributes to economic development in other dimensions, including investment, credit expansion, and non-state sector employment.

Qiao, Martinez-Vazquez, and Xu (2008) carried out a study on the relationship among fiscal decentralization and economic growth and equity in China from 1985-1998. The periods differ from the Zhang and Zou (2001) and Jin et al. (2005) studies. During the 1980s, China reformed its economy due to various failures from central economic planning and the Chinese government decentralized decision-making powers to local governments in order to promote more efficient resource allocation. The hypothesis of the research was that fiscal decentralization in China led to economic growth and increased regional inequality. The model used in the research is presented below:

$$\text{Growth}_{it} = \beta_0 + \beta_1 \text{Decentralization}_{it} + \beta_2 \text{Decentralization}_{it}^2 + \beta_3 \text{Tax}_{it} + \beta_4 \text{Tax}_{it}^2 + \beta_5 \text{Equity}_{it} + \beta_6 \text{Labor}_{it} + \beta_7 \text{Capital}_{it} + \mu_i + v_{it}$$

Where

growth	is the percent growth rate of nominal per capita GDP.
decentralization	is per capita provincial fiscal expenditure as a percentage of total per capita fiscal expenditure.
tax	is provincial total tax revenue as a percentage of total provincial GDP.
equity	is the ratio of the share of fiscal resource to the share of population, which ranges between 0-1.
labor	is the growth rate of labor.
capital	is the growth rate of capital investment.

The results indicate that expenditure decentralization has a positive relationship with economic growth; the higher the expenditure decentralization, the higher the level of economic growth. However, the relationship was not linear. The results show that China's fiscal decentralization led to increased inequality and

therefore the Chinese government had to improve its policy by concentrating on both economic growth and economic equity.

Desai, Freinkman, and Goldberg (2005) study examined the relationships between fiscal decentralization and economic growth in 80 local government organizations in Russia from 1996-1999; the period of Russia's fiscal reform, which placed an emphasis on tax sharing, expenditure assignment and clear and transparent criteria for grant allocation. Both cross-sectional and panel data analyses were applied in order to obtain the results. The research model is as follows:

$$y = \beta_0 + \beta_1 R + \beta_2 Q + \beta_3 (R \times Q) + \beta_4 X + \epsilon,$$

Where

- y is regional economic performance.
- R is the tax retention rate (revenue decentralization).
- Q is non-tax revenue.
- X is other control variables.
- € is random disturbance.

The results suggest that fiscal decentralization affects economic growth at a statistically significant level.

Yushkov (2015) examined the correlations between fiscal decentralization and economic growth in 78 Russian regions during 2005-2012, which is different from the research period of Desai et al. (2005). The decentralization variables included expenditure decentralization, revenue decentralization, and intergovernmental transfers. The model used in this research is shown below.

$$GRP_GR_{it} = \alpha_i + \lambda_t + \beta_D DEC_{it} + \beta_r TAX_{it} + \gamma' X_{it} + \epsilon_{it},$$

Where

- GRP_Gr_{it} is gross regional product per capita in region i in year t.
- α_i is the regional fixed effect.
- λ_t is the time effect.

DEC _{it}	is the fiscal decentralization in region i in year t, measured by expenditure decentralization, revenue decentralization, and intergovernmental transfers.
TAX _{it}	is the tax burden in region i in year t.
X _{it}	is the control variable in region i in year t.

The results show that expenditure decentralization is negatively correlated with economic growth. Whereby the study found that the local governments' locally collected revenue was only 50% of the total revenue. The local governments need to rely on government transfers, as they had insufficient budgets to perform public service duties and lacked the motivation to achieve spending efficiency. Therefore, results were not consistent with the hypothesis. Since the local governments needed to heavily rely on government transfers, the results show that intergovernmental transfers are positively correlated with economic growth.

Nguyen and Anwar (2011) investigate the relationships between fiscal decentralization and economic growth in Vietnam based on the assumption that fiscal decentralization can contribute to 1) reducing the size of government; 2) improved allocation of resources within the public sector; and 3) increased competition among subnational governments. The data used in this research covered 61 provinces of Vietnam from 1997 to 2006. The variables included both expenditure and revenue decentralization. The research model is shown below:

$$G_{it} = \alpha_0 + \alpha_1 FD_{it} + \alpha_2 E_{it} + \alpha_3 HC_{it} + \alpha_4 GAP_{it} + \alpha_5 LD_{it} + \alpha_6 L_{it} + \alpha_7 IF_{it} + \alpha_8 M_{it} + \varepsilon_{it}, (1)$$

The definition of variables are as follows:

G	is provincial economic growth rate (annual %)
FD	is fiscal decentralization: two measures are used to gauge the degree of fiscal decentralization: (1) provincial budgetary expenditure as a percentage of total budgetary expenditure and (2) provincial budgetary revenue as a percentage of total budgetary revenue

- E is exports of goods and services per capita (expressed in thousands of VND at constant prices).
- HC is human capital: HC is proxied by the number of university and college students per thousand persons.
- LD is learning by doing (the annual manufacturing value added as a percentage of GDP is used as a proxy).
- L is the growth rate of labor (annual %).
- GAP is technology gap: technology gap is measured as the percentage difference between the average growth of Ho Chi Minh City and other provinces.
- IF is the rate of inflation (annual %).
- M is financial development is measured by the growth rate of money supply (M2).
- ε_{it} is error term.

The results suggest that expenditure decentralization is negatively correlated with economic growth, while revenue decentralization is positively correlated with economic growth. This is because, during the first period of fiscal decentralization, the central government played a key role in investing while local governments exerted low levels of influence on economic expansion. The results indicated that expenditure decentralization can increase the chance of corruption and therefore have a negative effect on economic growth.

Adefeso (2014) studied the correlation between fiscal decentralization and economic growth in Nigeria from 1970-2013, taking account of both expenditures and revenue decentralization. The analysis model is as follows:

$$g_t = \delta_0 + \delta_1 m_t + \delta_2 \tau_t + \delta_3' x_t + \varepsilon_{1t}$$

Where

- g_t is the growth of real GDP per capital.
- m_t is fiscal decentralization.
- τ_t is the tax rate.

X_t is other variables, comprising health expenditure, human capital, and openness.

The results show that expenditure and revenue decentralization had no significant effect on economic growth. These results are not in line with the research hypothesis, probably due to the corruption of local politicians in Nigeria. This is similar to the findings of Nguyen and Anwar (2011), which also address the effect of local corruption.

5.3 Related Studies in Thailand

In Thailand, Krueathep (2010) examined the relationships between fiscal decentralization and economic growth from 1972-2008 using the time-series data analysis method. The research model is as follows:

$$Y_t = \alpha + b_1 FD_t + b_2 Z_t + e_t$$

Where

Y_t is economic growth.

FD_t is expenditure decentralization.

Z_t is other variables, comprising the share of export to GDP, the share of investment to GDP, the share of foreign direct investment to GDP, population growth, labor growth, the share of tax burden to GDP, the share of saving to GDP, and the share of bank credit to GDP.

The results show that there is no significant relationship between fiscal decentralization and economic growth in Thailand, especially after the enactment of the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act. This was because the expenditure policy of the local governments heavily relied on the central government's expenditure budget. By law, the local governments cannot run operating budget deficits or borrow money, so they had to find ways to balance each year's budget. In addition, the lack of fiscal

discipline of the local governments resulted in the inefficient allocation of resources for public service provisions.

Horrayangkul and Wutthirong (2013) study on the influence of fiscal decentralization factors on Thailand's economic growth from 2001-2009 utilized a time-series analysis method similar to Krueathep (2010) which harnessed secondary data collected from Thai government agencies using a multiple regression analysis technique. The model used in this study is shown below:

$$Y_t = a + b_t FD_{it} + b_t X_{it} + e_t$$

Where

- Y is economic growth
- X is control variables
- FD is the fiscal decentralization variables
- e is residuals

FD_{it} is the fiscal decentralization variables, comprised of: 1) the percentage of locally collected revenue to total government revenue (FD₁); 2) the percentage of locally collected revenue and shared tax revenue to total government revenue (FD₂); 3) the percentage of total local government revenue to total government revenue (FD₃); and 4) the percentage of locally collected revenue to total local government revenue (FD₄).

X_{it} is the independent variables, consisting of the percentage of change in labor force (X₁), the percentage of gross domestic investment to GDP (X₂), the inflation rate (X₃), the percentage of total value of imports and exports to GDP (X₄), the percentage of foreign direct investment to GDP (X₅), and the number of university enrollments (X₆).

Similar to the findings of Krueathep (2010), the results indicate that fiscal decentralization has no positive influence on Thailand's economic growth. This was mainly due to the following three reasons: 1) the operational style of local governments, which is not conducive to efficient management; 2) corruption in the

local governments which led to a lack of operational efficiency; and 3) the lack of power of local governments to collect their own revenue.

Nantharath, Laochankham, Kamnuasilpa, and Kang (2020) examine the effects of fiscal decentralization on economic growth in Thailand from 2004 to 2017. Panel data analysis was used to analyze the data across the country, covering the Northern, Northeastern, Upper Central, Lower Central, and Southern regions, by taking into account various fiscal decentralization variables such as revenue decentralization, expenditure decentralization, transfer dependency, and vertical fiscal imbalances. The research model of the study is:

$$Gpp_{it} = \phi_{it}fd_{it} + \gamma_{it}Pop_{it} + n_{it}Gfc_{it} + \varepsilon_{it}$$

Where

Gpp_{it} is the gross provincial product (GPP) of region i in year t .

fd_{it} is the fiscal decentralization (revenue decentralization, expenditure decentralization, transfer dependency, and vertical fiscal imbalance) of region i in year t .

Pop_{it} is the population size of region i in year t .

Gfc_{it} is the gross fixed capital of region i in year t .

The results show that fiscal decentralization is positively correlated with economic growth in Thailand. The study finds revenue decentralization, transfer dependency, and vertical fiscal imbalance have a significantly positive effect on the economic growth of all five regions. However, it the study found that expenditure decentralization has a negative effect on provincial economic growth with no statistical significance.

5.4 Review of Research Related to Inclusive Growth

A study by Ali and Son (2007) is one of the first research studies to introduce a new development approach called ‘inclusive growth’, adapted from social opportunity function. The concept was initiated because previous development

approaches were frequently criticized to focus only on economic growth without paying attention to equal benefit distribution. Statistics from many countries shows that the higher the economic growth, the higher inequality. If this issue is not effectively solved, it may affect political stability and public participation in sustainable economic expansion.

Ali and Son (2007) introduce the defining characteristics and measures of inclusive growth through their study in the Philippines in 1998 using the socio-economic household survey data from the National Statistical Office based on the assumption that the inclusive growth is proportional to the social opportunity function, comprised of two factors: 1) average opportunities available to the population, and 2) how opportunities are shared among the population. The variables of gender, education, and basic infrastructure such as electricity, clean drinking water and sanitation, were accordingly determined to reflect the equity of employment opportunities.

According to the results of the research, the poor have less employment opportunities than the non-poor. At the same income level, men have more employment opportunities than women, which imply that: 1) men enjoy greater job opportunities on average, and 2) the distribution of employment opportunities among men is more equitable than among women. The distribution of educational opportunities is also unequal. The results also suggest that children in poor households have less access to primary and secondary education than children in high-income households and that benefits arising from infrastructure projects are unequally allocated to people of different income levels.

Ianchovichina and Lundstrom (2009) examined the pace and pattern of growth in Zambia, which even though is a country with high economic growth, its citizens still face with poverty problems. The study asks whether rapid economic expansion without poverty management measures can affect economic sustainability in the long run. This is the first study to integrate these two topics through the concept of inclusive growth.

The results of this study show that important factors limiting returns to labor and job creation are market coordination failures such as poor market accessibility, public service input, and high-cost information. The study finds that coordination

failures are a key constraint to inclusive growth and that is necessary to improve the quality of and access to secondary and tertiary education in order for the poor to benefit from economic growth. In addition, the study finds that weak governance, especially poor government effectiveness, is a causal factor of market coordination failures and a key obstacle to inclusive growth.

Anand et al. (2013) research on inclusive growth investigated three main areas: 1) to develop a unified macro measure of inclusive growth that integrates economic growth and income distribution, 2) to use the unified macro measure to analyze inclusive growth in cross countries, divided into low-income countries and emerging markets, and 3) to demonstrate the relationship among inclusive growth and economic fundamentals, including competitiveness and economic structural changes encompassing globalization or the growing integration into global trade. The model is as follows:

$$Y^*_{i,t} - Y^*_{i,t-1} = \alpha_0 + \beta_1 \bar{Y}_{i,t} + \beta_1^\circ X_{i,t} + \eta_c + \gamma_t + \vartheta_{c,t}$$

Where

$Y^*_{i,t} - Y^*_{i,t-1}$ is the log-difference of $\bar{y}^*$ inclusive growth in country i at time t .

$\bar{Y}_{i,t}$ is the initial level of per capita PPP-adjusted income at the start of the 5-year panel period t to reflect conditional convergence.

$X_{i,t}$ is a set of growth and inequality determinants measured as averages over the 5-year panel period t .

The disturbance term in the regression consists of an unobserved country effect (η_c) that is constant over time, an unobserved period effect (γ_t) that is common across countries, and a component ($\vartheta_{c,t}$) that varies across both countries and years and is assumed to be uncorrelated over time.

The research results suggested that, in emerging markets, macroeconomic stability, education, and investment are essential to inclusive growth, while technological change plays a relatively small role. Moreover, trade openness,

financial openness, and foreign direct investment (FDI) are also important to inclusive growth.

Faisal and Sami (2018) investigated the determinants of inclusive growth in Pakistan by calculating GDP per capita growth and income inequality (GINI coefficient) from 1987-2016. The research method of this research is similar to the study of Anand et al. (2013). The model used is shown below:

$$IG_t = \beta_0 + \beta_1 INF_t + \beta_2 M2_t + \beta_3 TOT_t + \beta_4 BM_t + \beta_5 DCP_t + \varepsilon_t$$

Where

IG is the inclusive growth measured by inequality adjusted growth.

INF is the inflation rate taken for macroeconomic stability measure.

M2 is money supply growth.

BM is broad money to GDP ratio.

DCP is domestic credit to private sector.

TOT is terms of trade taken as measure for external sector stability.

The results revealed that Pakistan's inclusive growth depends mainly on macroeconomic stability and structural change. Other determinants of inclusive growth include external sectors, money supply growth (M2), and domestic credit (DCP). In addition, the study indicated that, over the past decades, Pakistan's economic development has risen in parallel with income inequality. If the problem of income inequality is not resolved, it will definitely affect the country's inclusive growth.

Regarding inclusive growth research conducted in Thailand, Pootrakool (2013) carried out a study on how national development from 1988-2011 has led to the improvement of quality of life and income of people in Thailand. The characteristics and problems of income distribution were analyzed using various techniques such as Gini coefficient, Theil Index, and household and individual surveys in order to find the determinants of household income and the possibility for social mobility that can be used to develop policy recommendations.

The research results showed that 1) Thailand's income distribution is still at a high level compared to other countries and did not decrease during the study period, 2) economic expansion is concentrated in some groups and areas, leading to inequality in various sectors, 3) low-income households can take advantage of economic development opportunities to develop themselves and pursue higher income, 4) the economic status of each household can shift up or down, depending on income level, 5) spatial differences, which used to be a key determinant of household income, have begun to lose its significance because of the greater integration of the economic system which have enabled all sectors similarly benefit from development.

However, several barriers hinder equal access to economic development, including; 1) opportunity inequality, resulting from unequal access to financial services and educational quality and causing children from poor households to inherit poverty from their parents, and 2) the concentration of the highest and lowest-income households which has caused little change to Thailand's Gini coefficient.

Pootrakool (2013) provided the following policy recommendations on inclusive growth: 1) The accessibility and quality of education, especially in rural and provincial areas, should be improved because education is a key determinant of future occupation and household income. Scholarships should be provided to poor households in order to enhance educational equality. 2) Agricultural technology should be developed to improve the production efficiency of poor farmers. 3) Agricultural households should be provided with access to the financial aid systems. 4) An environment conducive to income generation should be created especially in the dimensions of irrigation, water management, and weather insurance which can improve agricultural productivity. 5) Government policies on the distribution of prosperity to regional areas should be developed.

Table 5.1 Summary of Research Studies on the Relationships between Fiscal Decentralization and Economic Growth

Author	Dependable Variable	Independent Variable	Time	Scope of Sample	Research Result
Woller and Phillips (1998)	GDP per capita growth rate	Revenue decentralization and expenditure decentralization	1974-1991	23 less-developed countries	Fiscal decentralization is inversely correlated with economic growth when using the 5-year mean of the explanatory variables. However, there is no correlation between fiscal decentralization and economic growth when using the 3-year mean and the annual mean of the explanatory variables.
Martinez-Vazquez and McNab (2006)	Growth per capita GDP	Revenue decentralization and expenditure decentralization	1972-2003	66 countries	Fiscal decentralization is directly correlated with the slowdown of economic growth in developed countries. However, in developing countries, there is no evidence indicating the direct effect of fiscal decentralization on economic growth.
Pose and Krøijer (2009)	GDP per capita growth rate	Revenue decentralization and expenditure decentralization	1990-2004	16 central and eastern European countries	Both revenue decentralization and expenditure decentralization are negatively correlated with economic growth.
Bodman (2011)	Real GDP per capita	Revenue decentralization and expenditure decentralization	1981-1998	18 OECD countries	Fiscal decentralization is correlated with economic growth. Federal decentralized countries tend to have lower growth rates than unitary centralized countries.
Baskaran and Feld (2013)	Growth rate of labor productivity	Revenue decentralization and expenditure decentralization	1975-2001	23 OECD countries	There is no significant relationship between fiscal decentralization and economic growth.

Author	Dependable Variable	Independent Variable	Time	Scope of Sample	Research Result
Filippetti and Sacchi (2016)	Log difference in real per capita GDP	Tax decentralization	1970-2010	21 OECD countries	High tax decentralization leads to higher rates of economic growth when coupled with high administrative and political decentralization.
Lighthart and Oudheusden (2017)	Growth real GDP per capita	Revenue decentralization and expenditure decentralization	1990-2007	56 countries	Expenditure is positively and significantly correlated with economic growth, tax revenue is negatively correlated with economic growth, and tax revenue autonomy is positively correlated with economic growth. Using fiscal decentralization variables that better reflect the autonomy of subnational governments can increase the relationships between fiscal decentralization and economic growth.
Xie, Zou, and Davoodi (1999)	Logarithm of per capita output	Expenditure decentralization	1948-1994	The U.S. states	Fiscal decentralization is positively and significantly correlated with economic growth.
Zhang and Zou (2001)	Real growth rate of provincial income	Expenditure decentralization	1980-1992	26 provinces in China	Fiscal decentralization is negatively and significantly correlated with economic growth.
Jin, Qian, and Weingast (2005)	Growth of rural enterprise employment	Revenue decentralization and expenditure decentralization	1982-1992	29 provinces in China	Both revenue decentralization and expenditure decentralization are positively correlated with economic growth.

Author	Dependable Variable	Independent Variable	Time	Scope of Sample	Research Result
Qiao, Martinez-Vazquez, and Xu (2008)	Percent growth rate of nominal per capita GDP	Revenue decentralization and expenditure decentralization	1985-1998	392 local governments in China	Expenditure decentralization is correlated with economic growth.
Desai, Freinkman, and Goldberg (2005)	Private investment of GDP	Revenue Decentralization	1996-1999	80 local governments in Russia	Fiscal decentralization is positively and significantly correlated with economic growth.
Yushkov (2015)	Gross regional product per capita	Revenue decentralization and expenditure decentralization	2005-2012	78 local governments in Russia	Expenditure decentralization is negatively correlated with economic growth. Intergovernmental transfers are positively correlated with economic growth.
Nguyen & Sajid Anwar (2011)	Provincial economic growth rate	Revenue decentralization and expenditure decentralization	1997-2007	61 provinces in Vietnam	Expenditure decentralization is negatively correlated with economic growth, while revenue decentralization is positively correlated with economic growth.
Hammed Adetola Adefeso (2014)	Growth of real GDP per capita	Revenue decentralization and expenditure decentralization	1970-2013	Nigeria	Neither revenue decentralization nor expenditure decentralization has a significant effect on economic growth.
Krueathap (2010)	GDP growth rate	Expenditure decentralization	1972-2008	Thailand	Fiscal decentralization has no significant effect on economic growth.
Horrayangkul, and Wutthirong (2013)	GDP growth rate	Revenue decentralization and expenditure decentralization	2001-2009	Thailand	Fiscal decentralization has no significant effect on economic growth.

Author	Dependable Variable	Independent Variable	Time	Scope of Sample	Research Result
Nantharath, Laochankham, Kamnuasilpa, and Kang (2020)	Gross provincial product (GPP)	Revenue decentralization and expenditure decentralization	2004-2017	5 regions in Thailand	Fiscal decentralization is positively correlated with economic growth. Revenue decentralization, transfer dependency, and vertical fiscal imbalance are significantly and positively correlated with economic growth. Expenditure decentralization is negatively correlated with economic growth with no statistical significance.

Table 5.2 Summary of Research Studies Intensive Growth

Author	Time	Scope of Sample	Research Result
Ali and Son (2007)	1998	The Philippines	The poor have less employment opportunities than the non-poor. At the same income level, men have more employment opportunities than women.
Ianchovichina and Lundstrom (2009)	1962-2006	Zambia	The important factors limiting returns to labor and job creation are market coordination failures. These coordination failures are also a key constraint to inclusive growth. It is necessary to improve the quality of and access to secondary and tertiary education in order for the poor to benefit from economic growth. Poor government effectiveness is a causal factor of the market coordination failures and a key obstacle to inclusive growth.
Anand, Mishra, & Peiris (2013)	2000-2008	Cross-country	In emerging markets, macroeconomic stability, education, and investment are essential to inclusive growth, while technological change plays a relatively small role. Moreover, trade openness, financial openness, and foreign direct investment (FDI) are also important to inclusive growth.
Faisal and Sami (2018)	1987-2016	Pakistan	The results revealed that Pakistan's inclusive growth depends mainly on macroeconomic stability and structural change. Other determinants of inclusive growth comprise external sector, money supply growth, and domestic credit.
Pootrakool (2013)	1988-2011	Thailand	Economic expansion concentrates in some groups and areas, leading to inequality in various sectors. In terms of social mobility, the economic status of each household can shift upward and downward, depending on its income level. However, there are several barriers hindering equal access to economic development, which include 1) the opportunity inequality and 2) the concentration of the highest-income and lowest-income households.

CHAPTER 6

RESEARCH METHOD

The key objective of this chapter is to present the research method for testing the relationships between fiscal decentralization, local government organization performance, and inclusive growth. The testing of the relationships consists of three steps: 1) measuring the local government organization performance using the DEA method and productivity index, 2) creating an economic growth model, and 3) hypothesizing the relationships of fiscal decentralization, local government organization performance and other variables with economic growth, including inclusive growth.

6.1 Measuring the Local Government Organization Performance

In this study, the measurement of local government organization performance was comprised of two parts: 1) technical efficiency analysis using the DEA method, and 2) productivity assessments using the productivity index.

6.1.1 Technical Efficiency Analysis Using the DEA Method

There are several ways to measure technical efficiency. The efficiency measurement concept of Farrell (1957) is among the most popular approaches. Many economists have developed analytical methods and quantitative tools based on Farrell's concept in order to estimate frontier equations or frontier values and to analyze efficiency by comparing it with the frontier values. The two commonly used methods are: 1) data envelopment analysis (DEA) and 2) stochastic frontier analysis.

The DEA method was selected for this study because it has been widely used to measure the efficiency of various organizations and projects, especially in the government and non-profit sectors. The DEA can measure organizational efficiency by simultaneously considering multiple inputs and outputs, which are qualitative and

quantitative variables, through the use of mathematical programming, which helps to analyze the efficiency or inefficiency of resource utilization and productivity. It can also be used to identify the cause of inefficiency, which is useful for the improvement of organizational efficiency.

The DEA method uses linear programming to generate a non-parametric piece-wise surface (or frontier) and to measure the efficiency of the production units by comparing them with the frontier, with the assumption that the convex production frontier is a production frontier line created from the connection of various production units based on the linear combination model. In the context of the DEA, those production units are referred to as the decision-making unit (DMU).

The DEA technique was further developed by Charnes, Cooper, and Rhodes (1978) who proposed an input-oriented model that assumes constant returns to scale (CRS), with the assumption that the production unit is able to achieve the appropriate production levels. However, as there are many other factors obstructing the production unit from achieving the appropriate production level, Banker, Charnes, and Cooper (1984) introduce a new model focusing on variable returns to scale (VRS). Later, economists developed many other output-orientated DEA models. Therefore, at present, the DEA method can be used to measure organizational efficiency both in the dimension of input and output orientation as well as CRS and VRS assumptions, depending on the purposes and limitations of each study.

The DEA model initiated by Charnes et al. (1978) is shown below:

$$\begin{aligned} &\text{Maximize } h_0 = \frac{\sum \alpha_r \mu_r y_{r0}}{\sum \alpha_i v_i x_{i0}} \\ &\text{Subject to} \\ &1 \geq \frac{\sum \alpha_r \mu_r y_{rj}}{\sum \alpha_i v_i x_{ij}} \quad j=1, \dots, n \\ &\mu, v \geq 0 \end{aligned}$$

Where

- x_{ij} = inputs i from DMU_j
- y_{rj} = outputs r from DMU_j
- μ, v = coefficient vector of inputs and outputs
- α = weighted average of inputs and outputs

This is a fundamental model used to measure the efficiency of DMUs. The objective function is an output equation. The constraints consist of the efficiency inequality of each DMU. The inequality is the ratio of output to input with a maximum value of 1. The results will be obtained from the objective function. A DMU with a score of less than 1 is deemed inefficient relative to other units.

According to Figure 6.1, there are four units of production, A, B, C, and D whereby each unit produces the same type of product and uses the same input. The DEA technique is used to analyze efficiency, resulting in the production frontier line as shown in the diagram. The VRS production frontier line is represented by a solid line, starting from the origin to point A and point A to point C, while the CRS production frontier line is represented by a dash line, starting from the origin and passing through the production point of unit A. This shows that under the assumptions of the model, Unit A is the production unit with 100% efficiency because it has a higher output/input ratio than other production units. The production units that cannot produce outputs in accordance with the production frontier line will be deemed inefficient.

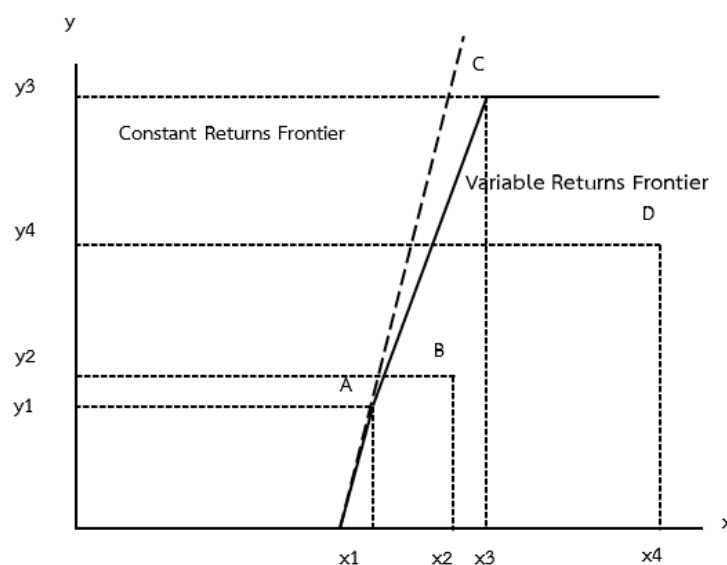


Figure 6.1 Production Frontier Line Resulting from the DEA Method

The DEA efficiency evaluation can be categorized into two approaches: 1) the input-oriented model and 2) the output-oriented model. The input-oriented model aims to study how the production unit can proportionally reduce the number of inputs

without affecting the output volume. The output-oriented model intends to study how the production unit can proportionally increase the output volume without changing the number of outputs. In the case of the CRS assumption, the results obtained from these two models will be the same. However, in the case of the VRS assumption, the obtained results will be different.

The DEA model can be presented in the form of a linear programming problem as follows:

1) Input-oriented DEA variable returns to scale (VRS) model

$$\begin{aligned} \min_{\theta, \lambda} \quad & \theta \\ \text{st} \quad & -y_i + Y\lambda \geq 0 \\ & \theta x_i - x\lambda \geq 0 \\ & N1'\lambda = 1 \\ & \lambda \geq 0 \end{aligned} \quad \dots\dots\dots(1)$$

Where

- θ = scalar value indicating the efficiency score of the production unit 1 with the value of 1 representing a point on the frontier
- λ = N x 1 vector of constants
- 1 = production unit at 1, 2, 3..... N
- N1 = N x 1 vector of ones

In an input-oriented model, the VRS linear programming problem is differentiated from the CRS linear programming problem, as the convexity condition ($N1'\lambda = 1$) has been added.

2) Output-oriented DEA variable returns to scale (VRS) model

$$\begin{aligned} \text{Max}_{\phi, \lambda} \quad & \phi \\ \text{st} \quad & -\phi y_i + Y\lambda \geq 0 \\ & x_i - X\lambda \geq 0 \\ & N1'\lambda = 1 \\ & \lambda \geq 0 \end{aligned} \quad \dots\dots\dots(2)$$

Where $1 \leq \phi < \infty$ and the TE score of $1 / \phi$ is between 0 and 1.

The DEA model will generate an efficiency score between 0 and 1. A production unit with an efficiency score of 1 indicates that it can operate on the production frontier or has a production efficiency of 100%. On the other hand, a production unit with a score of less than 1 indicates that it does not operate on the production frontier and will be deemed inefficient compared to other units.

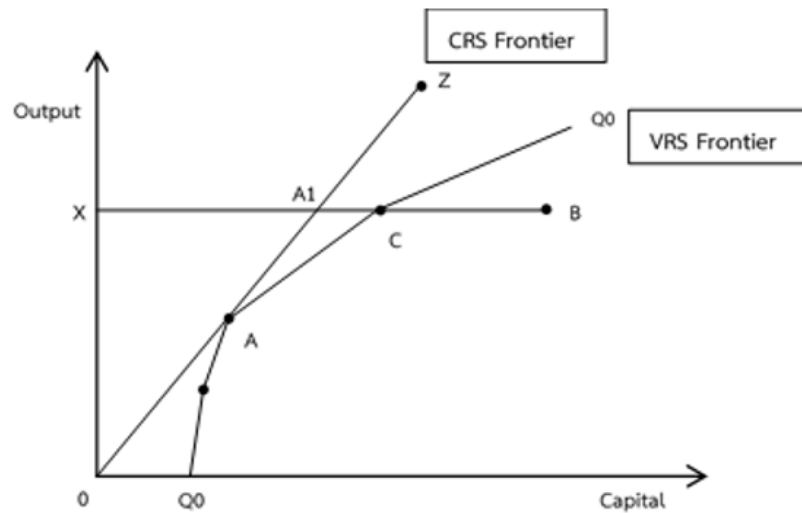


Figure 6.2 Constant Returns to Scale Frontier and Variable Returns to Scale Frontier

Based on the above figure, the OZ line represents the CRS frontier that the production unit A operates on, which suggests that the production unit A has technical efficiency in production.

The Q_0Q_0 line represents the VRS frontier. A production unit that can operate on the Q_0Q_0 line is deemed to have technical efficiency. The VRS frontier shows that the appropriate level of outputs/inputs can vary according to the scale of production. Therefore, scale efficiency can be determined by comparing CRS technical efficiency (TE_{CRS}) with VRS technical efficiency (TE_{VRS}).

At production point B, technical inefficiency in production is determined by the distance from point B to the CRS frontier line, which is equal to XA_1/XB . The total technical inefficiency (TE_{CRS}) is composed of 2 parts: 1) pure technical inefficiency (TE_{VRS}), which is equal to the XC/XB , and 2) scale inefficiency (SE), which is equal to the XA_1/XC .

Thus, the relationship between the three efficiency values can be presented as follows:

$$XA_1/XC = XA_1/XB * 1/(XC/XB) \quad \text{..... (3)}$$

$$SE = TE_{CRS}/TE_{VRS} \quad \text{..... (4)}$$

Efficiency Score

Global technical efficiency (TE_{CRS}) consists of 2 parts: pure technical efficiency (TE_{VRS}) and scale efficiency (SE). Their relationships are shown in the above equation (4).

TE_{CRS} refers to global technical efficiency or overall efficiency, which can be obtained from the calculation of CRS technical efficiency. The calculated efficiency values consist of technical efficiency and scale efficiency, which can indicate production inefficiency resulting from the improper use of inputs and an inappropriate production scale.

TE_{CRS} value can be less than or equal to 1. If the TE_{CRS} value is 1, the production unit has a production efficiency of 100% and can operate on the frontier. If the TE_{CRS} value is less than 1, the production unit is inefficient and does not operate on the frontier.

TE_{VRS} refers to pure technical efficiency, called technical efficiency, which can be obtained from the calculation of VRS technical efficiency. The calculated efficiency value only consists of production efficiency.

TE_{VRS} value can be less than or equal to 1. If the TE_{VRS} is 1, the production unit is deemed technically efficient. If the TE_{VRS} is less than 1, the production unit is technically inefficient due to improper use of inputs.

SE refers to scale efficiency or scale inefficiency. This value indicates a proportional change of outputs, when inputs are modified.

A production unit that has scale efficiency can modify the number of inputs in order to obtain a proportional increase of outputs. For example, if inputs are increased by 10%, the production unit with scale efficiency will be able to produce a 10% increase in outputs, which is called constant returns to scale. The production unit has increasing returns to scale when it can generate more than a 10% increase in outputs.

On the other hand, if production unit cannot reach a 10% increase in outputs, it has decreasing returns to scale.

SE can be less than or equal to 1. If the SE value is 1, it means that the production unit has scale efficiency. If the SE value is less than 1, the production unit has scale inefficiency due to an inappropriate production scale.

Therefore, when using the same set of data in the analysis and when comparing the CRS and VRS efficiency values, if the obtained results are different, it means that there is inefficiency resulting from an inappropriate production scale.

6.1.2 Productivity Assessment Using the Productivity Index

The assessment of local government productivity in this study was adapted from the concept of production unit measurement, which focuses on a comparison of inputs and outputs for a certain period of time. Based on this concept, productivity improvements can be carried out in two ways: 1) reducing inputs to achieve the same or higher outputs, and 2) increasing outputs by using the same or lower inputs.

The measurement of productivity can be divided according to the number of inputs into 1) single-factor productivity measurement and 2) multi-factor productivity measurement. Single-factor productivity indicates the ratio of one resource (input) to the goods and services produced (outputs), which can be calculated by the following equation.

$$\text{Single-factor productivity} = \frac{\text{Outputs produced}}{\text{Input used}}$$

On the other hand, multi-factor productivity indicates the ratio of many resources (inputs), such as labor, raw materials, energy, capital, and others, to the goods and services produced (outputs). The equation used to calculate multi-factor productivity is as follows:

$$\text{Multi-factor productivity} = \frac{\text{All outputs produced}}{\text{All inputs used}}$$

However, in the real world, calculating the productivity of each production unit is associated with different kinds of inputs and outputs. Thus, the method of index number calculation is used to calculate output index, input index, and productivity index according to the following equation:

$$\text{Productivity index} = \frac{\text{Output index}}{\text{Input index}}$$

The above equation is used to calculate productivity index in a static period. In order to calculate productivity index in two or more time periods, it is important to consider a base year, as shown in the equation below:

$$\text{Productivity index} = \frac{\left(\frac{O_{1t}}{O_{10}} \right) \left(\frac{O_{2t}}{O_{20}} \right) \left(\frac{O_{3t}}{O_{30}} \right) \cdots \left(\frac{O_{nt}}{O_{n0}} \right)}{\left(\frac{I_{1t}}{I_{10}} \right) \left(\frac{I_{2t}}{I_{20}} \right) \left(\frac{I_{3t}}{I_{30}} \right) \cdots \left(\frac{I_{mt}}{I_{m0}} \right)}$$

where

O_{it} is the i^{th} output produced in year t ($i = 1, 2, \dots, n$).

O_{i0} is the i^{th} output produced in the base year.

I_{jt} is the j^{th} input used in year t ($j = 1, 2, \dots, m$).

I_{j0} is the j^{th} input used in the base year.

Based on this equation, a productivity index value of greater than 1 indicates an increase in productivity, whereas a value of lower than 1 indicates a decline in productivity.

6.2 Economic Growth Model

This study utilizes a Solow-type growth model. The essence of this model is that the factors contributing to economic development include capital accumulation,

savings, and workforce. However, Solow believes that when a country accumulates capital to a certain extent, that country will transform into a steady state, while the large population reflects the massive labor force that will contribute to the GDP of the country. In addition, other factors affecting the country's economic development are technological advancement, which can enhance labor productivity and increase the GDP. Therefore, the equation of production function can be written as follows:

Where

Y = quantity of products or services that a society can produce in a certain period of time (an indicator of the economic growth rate)

A = technological advancement

K = amount of capital

L = volume of labor

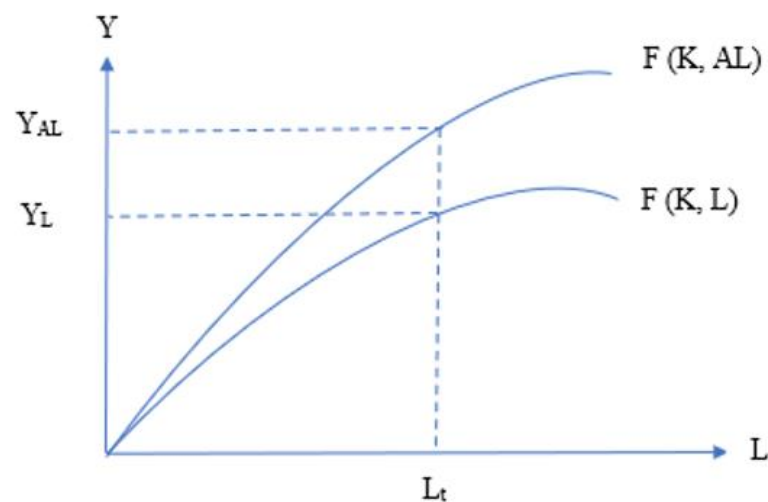


Figure 6.3 Real Gross National Product from Technological Advancement

The vertical axis represents the real gross national product. The horizontal axis represents the number of laborers. The $F(K, L)$ line is the original production function line, meaning that when using the L_t labor, the real gross national product Y_L is obtained. When advanced technology is used, the production function line moves up to $F(K, AL)$, which represents the production function with skilled labor and technological progress. It indicates that when using the same L_t labor, the real gross national product Y_{AL} will be obtained.

According to the production function concept of Cobb Douglas stated in Solow's model, the components of economic growth rate can be classified as follows:

$$Y = A K^{\beta_1} L^{\beta_2}$$

Where

Y	= real gross national product
K	= capital stock
L	= labor
A	= technology
β_1	= capital stock elasticity
β_2	= elasticity to labor

The above equation can be converted into the log form as follows:

$$\ln(Y) = \ln(A) + \beta_1 \ln(K) + \beta_2 \ln(L)$$

β is the production elasticity to the capital stock. When taking the derivatives with respect to time, the result will be as follows:

$$\frac{d \ln(Y)}{dt} = \frac{d \ln(A)}{dt} + \beta_1 \frac{d \ln(K)}{dt} + \beta_2 \frac{d \ln(L)}{dt}$$

The equation can be rewritten as:

$$\frac{Y'}{Y} = \frac{A'}{A} + \beta_1 \frac{K'}{K} + \beta_2 \frac{L'}{L}$$

This equation is called the growth accounting equation. It indicates that the economic growth rate is equal to the weighted sum of the growth rates of capital stock, labor, and technology.

$\frac{Y'}{Y}$	= The rate of change of output
$\frac{A'}{A}$	= The rate of change of technology
$\frac{K'}{K}$	= The rate of change of capital
$\frac{L'}{L}$	= The rate of change of labor
β_1	= The elasticity of capital
β_2	= The elasticity of labor

In addition, in order to ensure the efficiency of model estimation, the estimation technique was further developed by determining the differences of data sets and assumptions that divide the model into two approaches: fixed effects and random effects. The suitability of the model was also examined.

6.2.1 Fixed Effect Model

The fixed effect model uses fixed individual effects in a cross-sectional unit at all times. The assumption of this model is that differences of data can affect the changes in parameters or coefficients of each data set. Thus, the differences should be fixed using the least squares dummy variable (LSDV) method, based on the following equation.

$$y_{it} = \alpha_0 + \alpha_i + \beta'x_{it} + u_{it}$$

Where

- y_{it} is the dependent variable vector of each i group at different times.
- α_0 is the overall constant.
- α_i is the constant in each data group (cross-sectional unit, group effect).
- β' is the vector of approximate parameters of the independent variable.
- x_{it} is the independent variable vector of each i group at different times.
- u_{it} is the distraction.

6.2.2 Random Effect Model

The random effect model assigns the coefficients of each data group to be random variables rather than fixed variables as in the fixed effect model. The equation can be generally written as follows:

$$y_{it} = \alpha + \beta'x_{it} + \varepsilon_i + u_{it}$$

Where

Y_{it} is the dependent variable vector of each i group at different times.

α is the constant.

β' is the vector of approximate parameters of the independent variable.

X_{it} is the independent variable vector of each i group at different times.

ε_i is the interference, which is a random variable in each i group.

U_{it} is the distraction.

The Lagrange multiplier test was used to ensure the suitability between the classical model and the random effect model. The suitability between the fixed effect model and the random effect model was then evaluated using the Huasman Test in order to obtain the most effective model for this study.

6.3 Hypotheses

The hypotheses of the variables used in the experiment were determined as follows:

1) Fiscal Decentralization, Excluding Grants (FD)

In theory, fiscal decentralization is the transfer of power to local government organizations. The main principle of fiscal decentralization is to make local government organizations independent and develop sufficient capacity to determine fiscal policies on their own (local autonomy decision-making), and rely less on financial support, especially special grants from the central government. Local government organizations must be responsible for local administrative affairs because the central government has to handle various problems at the national level and

cannot address all local issues. Giving self-governing power to local government organizations and enabling them to solve problems makes local people become more politically alert and increasingly participate in local political activities, which contributes to the national economic development in the long term. However, fiscal decentralization, excluding grants, sometimes does not affect economic growth and inclusive growth because this variable is related to locally levied revenues. In Thailand, the central government requires local government organizations to collect taxes according to prescribed laws. Thus, local government organizations cannot independently collect taxes based on local economic requirements. For example, when a local government organization follows local economy and inclusive growth policies, it cannot use the reduction of local taxes as a fiscal tool because the levy of local taxes is fixed by law. However, the hypothesis of this study was fiscal decentralization, excluding grants, is related to economic growth and inclusive growth.

2) Fiscal Decentralization, Including Grants (FDG)

Brennan and Buchanan (1980) indicate that grants can be used to increase the monopoly power of local government organizations because local government organizations have to follow the objectives of the grants. Musgrave and Musgrave (1959) defines the primary objectives of the public sector as follows: 1) to oversee the stability of macroeconomic systems, including inflation, the balance of trade, and balance of payments; 2) to ensure efficient resource allocations such as the allocation of the national budget to support economic balance and sustainable growth; and 3) to promote equity and income distribution. In addition, the public sector also has another important goal—to achieve economic expansion. Government grants are often used as a fiscal tool to stimulate the local economy and increase local economic growth, which is beneficial to national economic expansion.

However, Thailand's fiscal decentralization is asymmetric; it focuses on expenditure decentralization rather than revenue decentralization. Thai local government organizations have a lot of local administrative duties to implement but have limitations in finding income and determining appropriate local tax rates, leading to problems in fiscal expenditure-revenue imbalance. Local government administrators lack the freedom to make fiscal policy decisions and then need to rely

on grants from the central government. This makes the existing public policy unable to respond to local needs and causes fiscal decentralization, including grants, to have no relationship with economic growth and inclusive growth. Thus, the hypothesis used in this study is that fiscal decentralization, including grants, are not related to economic growth and inclusive growth.

3) Population (POP)

The size of the population is generally positively correlated with economic growth. This is consistent with the Cobb Douglas production function model, which was used in this study to demonstrate a positive correlation between population and production yield. However, there are cases whereby when the size of the population increases, economic growth declines due to low productivity. The high proportion of a dependent aging population, the exploitation of unskilled labor, and a lack of human capital development to support the country's development approach that shifts from labor-intensive to a technology-intensive economy may sometimes lead to a negative correlation between the size of the population and economic growth. However, the hypothesis used in this study is that the size of the population is positively related to economic growth and inclusive growth.

4) Household Income Per Capita (PY)

According to the consumption function, when people have higher income, they are able to consume more products, causing the circulation of money and consequently resulting in economic growth and inclusive growth. However, there may be a case when the household income per capita increases, but public consumption declines, because consumers delay their decisions due to the forecast of long-term economic uncertainty. For example, people tend to delay their current consumption if an economic problem is forecasted to occur in the future. However, the hypothesis of this study was determined as household income per capita is positively related to economic growth and inclusive growth.

5) Credit of Commercial Banks

In this study, the credit of commercial banks is used as a capital variable in the Cobb Douglas production function model. In general, the volume of commercial bank credit is positively correlated with economic growth, as an increase in commercial bank credit reflects an expansion of economic investment including

inclusive growth, public and private consumption and economic circulation. Nevertheless, increases in commercial bank credit can cause declines in economic growth when the lower productivity of capital goods that cannot respond to economic changes. However, the hypothesis of this study was the volume of commercial bank credit is positively related to economic growth including inclusive growth.

6) Number of Business Establishments (ESTB)

Provinces with a large numbers of business establishments are likely to have many economic activities associated with the production of goods and services, which contributes to provincial economic expansion in the long-term. However, the type and size of establishments (small, medium, and large) may affect economic development at different levels. Sometimes, the number of establishments may not correlate with economic expansion in long-term. However, the hypothesis of this study was the number of business establishments is positively related to economic growth including inclusive growth.

7) Amount of Electricity Distribution (ELECT_SOLD)

The Metropolitan Electricity Authority and the Provincial Electricity Authority sell electricity to two main customer groups: 1) small, medium and large enterprises, accounting for 70 percent of electricity sales nationwide, and 2) the household sector. Therefore, a higher volume of electricity sold can indicate a higher level of economic development. Nevertheless, the volume of electricity sold is not correlated with economic expansion probably due to a lack of production efficiency among related enterprises. However, the hypothesis of this study was the amount of electricity distribution is positively related to economic growth and inclusive growth.

8) Number of Tourists (No_TOURISM)

The number of Thai and foreign tourists travelling to provincial areas helps to increase spending in local communities and stimulates the provincial economy through the consumption of goods and services, such as travel and accommodation expenses. Nevertheless, tourists spending less money and a slowdown in purchasing power amid economic constraints can lead to a failure to stimulate the development of local provincial economies. However, the hypothesis of this study was the number of tourists is positively related to economic growth and inclusive growth.

9) Local Government Organization Performance (EFF, PDT)

In general, a high-performing local government organization will be able to utilize the local administration budgets to efficiently meet the needs of local people. Nevertheless, when local government organizations focus more on solving inequalities and disparities among localities the performance of local governments may not be correlated with economic and inclusive growth. However, the hypothesis of this study was the performance of local government organizations is positively related to economic growth and inclusive growth.

Table 6.1 Summary of the Assumption of Variables

Independent Variables	Relationship with Economic Growth and Inclusive Growth
Fiscal decentralization, excluding grants (FD)	Positive relationship
Fiscal decentralization, including grants (FDG)	Negative relationship
Monthly household income per capita (PY)	Positive relationship
Amount of credits of commercial banks (Credit)	Positive relationship
Number of business establishments (ESTB)	Positive relationship
Amount of electricity distribution (ELECT_SOLD)	Positive relationship
Number of tourists (No_TOURISM)	Positive relationship
Size of the population (POP)	Positive relationship
Efficiency of local government organization (EFF)	Positive relationship
Productivity of local government organization (PDT)	Positive relationship

CHAPTER 7

RESULTS

This chapter presents the research results which can be divided into two parts. First, the performance of local government organizations, comprised of efficiency and productivity, which was evaluated using the data envelopment analysis and productivity index. In this dissertation, the provinces in Thailand were selected as the unit of analysis, from 2010-2017. Second, the estimation of the model using econometrics to test the impact of fiscal decentralization on local government performance and economic growth including inclusive growth where the Solow growth model is utilized.

7.1 Data and Data Sources

This research determines the province as the unit of analysis. Seventy-six provinces (except Bueng Kan) were used for this study from 2010-2017 and secondary data from government agencies were used. The research was divided into two stages as follows:

First, the calculation of the efficiency value of local government organizations through the implementation of data environment analysis, developed from linear programming where the input includes: 1. area size; 2. size of the population; 3. shared tax revenue; and 4. number of employees of the local government. The output was comprised of the following: 1. locally levied revenue; 2. amount of solid waste collected; and 3. elderly subsistence allowance (calculated based on the number of elderly eligible for receiving a subsistence allowance). If the technical efficiency score was equal to 1, the local government organization would be deemed to be efficient or to have implemented best practices.

In addition, the productivity value of the local government organization was also calculated using the productivity index. The input includes: 1. size of the

population; 2. shared tax revenue; and 3. number of employees of the local government. The output consists of the following: 1. locally levied revenue; 2. amount of solid waste collected; and 3. elderly subsistence allowance.

The data from the following sources is used:

- 1) Area size, size of the population, shared tax revenue, locally levied revenue, number of employees of the local government organization in the Department of Local Administration.
- 2) The amount of solid waste collected from the Pollution Control Department.
- 3) Elderly subsistence allowance (calculated based on the number of elderly eligible for receiving a subsistence allowance) from the National Statistical Office.

The second stage studies the relationship between fiscal decentralization and the performance of the local government organization. The main variables include the following: 1) the variable of fiscal decentralization, excluding grants (FD) that would take account the locally levied revenue by the local government organization in comparison with the total revenue only; 2) the variable of fiscal decentralization, including grants (FDG) that would take account of the locally levied revenue and grants by the local government organization in comparison with the total revenue; and 3) the variable of performance of the local government organization calculated from the first stage together with other control variables which were analyzed using the economic growth model based on the data collected from the following sources:

- 1) Data on real gross provincial product per capita from the Office of the National Economic and Social Development Council.
- 2) Data on the locally levied revenue and grants from the Department of Local Administration.
- 3) Data on Gini coefficient and the number of poor from National Statistic Office.
- 4) Data on the size of the population from the Office of the National Economic and Social Development Council.
- 5) Data on the average monthly income per household from the National Statistical Office.

- 6) Data on credits of commercial banks from the Bank of Thailand.
- 7) Data on the number of business establishments from the Social Security Office.
- 8) Data on the amount of energy distribution from the Metropolitan Electricity Authority and Provincial Electricity Authority.
- 9) Data on the number of tourists from the Office of Permanent Secretary of Ministry of Tourism and Sports.

The efficiency and productivity values of each local government organization obtained through the DEA and productivity index are shown in the appendix A and B respectively.

7.2 Analysis of Local Government Capacity

After the calculation of the efficiency of the local government organization of each province in Thailand by implementing data envelopment analysis, the findings were used to analyze the local government capacity by comparing the solid waste management of the local government organization in the provinces with capacity, represented by Samut Sakhon Province, and provinces with low capacity, represented by Saraburi Province. Samut Sakhon and Saraburi have similar basic geographic and economic conditions. Both of them are located not far from Bangkok and their local areas consist of both agricultural and industrial zones.

The researcher chose to study the solid waste management of the local government organization because solid waste management is a common challenge in almost all provinces, especially in urban and neighboring areas, where economic development and population growth are on the rise. The amount of solid waste continues to increase but there is still a lack of proper waste management. Moreover, poor solid waste management has a direct effect on local people and leads to the problem of accumulated waste in many areas.

The solid waste management efficiency was analyzed by considering solid waste collection and disposal systems and solid waste problems and solutions. The executives of local government organizations and related provincial government organizations were also interviewed regarding their opinions on solid waste

management. Although their opinions might come be one-sided or contain some misunderstandings, the researcher thought that they could be used as a knowledge base to jointly create solutions and recommendations at the policy and operational levels. The solid waste management efficiency in this study is presented through two main actors: 1) the central and provincial governments responsible for formulating overall solid waste management policies, and 2) local government organizations, which have the duty to implement the solid waste management policies.

7.2.1 The Central and Provincial Governments: Reflection of Public Policy

In the past, solid waste management was the responsibility of local government organizations. Each of them had to find ways to dispose of the solid waste in its own area. However, many local government organizations are unable to manage their own solid waste and have had to transport to other areas. In addition, some local government organizations lack knowledge on how to properly manage solid waste, which leads to overflowing waste. The amount of solid waste continues to increase, while the proportion of sanitarily disposed solid waste and recycled waste is still low. Thus, the central and provincial governments, as well as the private sector, need to take part in solving solid waste problems at the provincial level.

1) Issuing laws to practically solve solid waste problems

In order to ensure that all local government organizations carry out solid waste management in the same direction, the Thai government has issued several laws and policies related to solid waste management, such as the 1992 Enhancement and Conservation of the National Environmental Quality Act and the 2007 amended version, which were created to prevent environmental degradation and to encourage private agencies and the general population to participate in promoting and preserving environmental quality. The 2017 Act on the Maintenance of the Cleanliness and Orderliness of the Country (No.2) is an amendment of the 1992 version with additional details concerning the issuance of ministerial regulations regarding sewage and solid waste management fees and the assignment of solid waste management duties to private agencies. Other laws, such as the 1997 Determining Plan and Procedures of Decentralization to the Local Government Organization Act

and the 2006 amended version, which specify that the local government organization has the duty to provide public services for the benefit of local people to maintain the cleanliness and orderliness of localities and to manage sewage, solid waste, and wastewater, exist. In addition, the law on the establishment of the local government organization also states that the TAO, Municipality, and the PAO, have the duty to maintain the cleanliness of roads, walkways, and public places and to dispose of sewage and solid waste. These laws are one of the mechanisms driving local government organizations to perform their duties as assigned.

2) Attempting to solve solid waste problems in an integrated way

In addition to the laws on solid waste management, the government has formulated various policies to be used as solid waste management guidelines for the local government organization, such as the National Solid Waste Management Master Plan (2016-2021), which was created under the conceptual framework of recycling, reusing, and reducing solid and hazardous waste at the source. According to this master plan, the Ministry of Interior must ensure that all provinces and local government organizations are able to create their own solid waste management plan in accordance with the national master plan and to develop a provincial action plan for environmental quality management in order to request an annual budget for solid waste management. There is also the Thailand Zero Waste Action Plan According to the Participatory State Principle (Phase 1: 2016-2017), which assigns the Ministry of Interior to oversee the practical implementation of solid waste management among provincial governments and local government organizations and to establish “Thailand Zero Waste Center” in collaboration with other agencies, such as the Ministry of Natural Resources and Environment, the Ministry of Public Health, the Ministry of Industry, the Ministry of Education, and the Prime Minister’s Office (Public Relations Department), in order to integrate the operations of all relevant organizations, provide waste management advice, and follow up and accelerate solid waste management operations based on the action plan. Moreover, a working group on municipal solid waste management responsible for the “Clean City Project,” consisting of community leaders, municipal council members, and public health volunteers, was set up under the supervision of the district chief to function as a driving mechanism at the local level.

3) Building cooperation among related organizations and personnel preparation

According to interviews with C. Boonprakhong (personal communication, August 3, 2020), Permanent Secretary of Samut Sakhon Municipality, and W. Wannuch (personal communication, November 29, 2020), Director of the Samut Sakhon Provincial Office for Local Administration, regarding the integrated approach to solid waste management, the researcher found that this approach motivates all related organizations to participate in finding common solutions to solid waste problems, which is different from the past where each organization worked separately. However, in practice, each organization still works separately based on the ministerial command structure. For example, the Provincial Natural Resources and Environment Office acts as a policy organization responsible for monitoring and evaluating environmental situations and for providing solid waste management advice to various agencies; the Provincial Office for Local Administration acts as an operational organization overseeing the local government organization's implementation of solid waste collection; the Provincial Public Health Office takes care of infectious waste management, and; the Provincial Industrial Office is responsible for the disposal of industrial waste. At the same time, budget constraints and personnel limitations are also limitations. As personnel responsible for solid waste management, have to perform other tasks as assigned, they cannot fully concentrate on solving solid waste problems. Provinces with a large numbers of local government organizations and local government organizations located in remote areas are especially prone to a lack of regular support or close follow-up.

The implementation of solid waste management by local government organizations is different in each province, depending on specific problems and obstacles. Therefore, it is essential to understand the environmental context of each local area in order to accurately analyze the cause of problems and to find appropriate solutions. In the next section, the implementation of solid waste management in each province is presented through the local government organizations.

7.2.2 The Local Government Organization: Reflection of Practical Operations and Solutions

7.2.2.1 Samut Sakhon Province

Samut Sakhon is city with full capacity in terms of industry, fisheries, and agriculture although it is only 879.56 square kilometers: 73rd in terms of size. It is a province connecting the Central and Southern regions of the country. According to the Office of the National Economics and Social Development Council, the gross provincial product (GPP) in 2017 was 398,103.81 million Baht, which was the 6th highest of the country. Samut Sakhon also had a real gross provincial product per capita of 411,320.16 Baht, the 7th highest of the country. The key business sector driving the economy of the province is non-agricultural and includes the manufacturing sector, followed by wholesale and retail trade. Samut Sakhon is a metropolitan province in a pollution control area. With its 42-kilometer coastline, Samut Sakhon is the center of marine fisheries, aquaculture, and the fisheries industry.

1) Problems and Obstacles

(1) Problems from population density and unregistered population

Samut Sakhon is a province with a dense population; 610.97 people per square kilometer, which is the 3rd highest of the country after Bangkok (3,622.28 people per square kilometer) and Nonthaburi (1,976.10 people per square kilometer). The most densely populated area is Krathum Ban District, followed by Mueang Samut Sakhon District and Ban Phaew District. The population density has a direct effect on the amount of waste generated. According to an interview with W. Wannuch (personal communication, November 29, 2020), Director of the Samut Sakhon Provincial Office for Local Administration, Samut Sakhon's dense population has led to difficulties in finding a location to build a waste disposal plant. The construction of many waste disposal factories in the province has been postponed due to frequent objections and complaints from neighboring residents.

In addition, Samut Sakhon is a province with high economic expansion and a home to many industrial factories and estates. It has the 4th highest number of unregistered people in the country after Bangkok (2,271,000 people),

Samut Prakan (603,000 people), and Chonburi (511,000 people). These unregistered people include both Thai workers from other provinces as well as legal and illegal foreign workers. The large size of the unregistered population has led to an increase in population density which affects the solid waste management of the province. Moreover, the increasing number of industrial factories in Samut Sakhon has resulted in a large amounts of industrial waste, which exceeds the capacity of local government organizations to properly dispose of, leading to the province dumping industrial waste in neighboring areas.

(2) Inadequate and inefficient solid waste collection

The collection of solid waste in Samut Sakhon can be divided into two forms: 1) solid waste collection managed by the local government organization, and 2) solid waste collection managed by private companies. After the collection of solid waste is completed, 60% of it is disposed of within Samut Sakhon, 26% is disposed of outside the province, and 14% is left with no systematic disposal. Some people collect their solid waste and dispose of it by burning, which is an unsanitary method. Undisposed solid waste leads to the problem of accumulated waste.

Table 7.1 The Amount of Solid Waste Generated and Collected in 2017

District	Solid Waste Generated (Ton/Day)	Solid Waste Collected (Ton/Day)	Percentage of Solid Waste Collected (Ton/Day)
Mueang Samut Sakhon	724	593	81.91%
Krathum Ban	322	298	92.55%
Ban Phaew	61	57	93.44%
Total	1,107	948	85.64%

Source: Provincial Office of Natural Resources and Environment Samut Sakhon (n.d.)

Table 7.1, in 2017 shows that three districts in Samut Sakhon Province, namely Mueang Samut Sakhon, Krathum Ban, and Ban Phaew, generated a total of 1,107 tons of solid waste per day, of which 948 tons per day was

collected (85.64%), while 159 tons per day was left as accumulated waste (14.36%). According to an interview with W. Wannuch (personal communication, November 29, 2020), Director of the Samut Sakhon Provincial Office for Local Administration, most of the accumulated waste belongs to small local government organizations in remote areas. These small local government organizations mostly dump waste in a dumping site or a pit before covering it with soil, which is considered an unsanitary method. However, due to the sparse population density, they rarely receive complaints from local people. On the other hand, large local government organizations with dense populations receive more complaints and have to hire private companies to carry out waste disposal services because they cannot dispose of their waste by using an unsanitary landfill method.

Based on an interview with C. Boonprakhong (personal communication, August 3, 2020), Permanent Secretary of Samut Sakhon Municipality, concerning waste management problems in Samut Sakhon Province, it private companies are selected to manage waste disposal services according to the determined contractor selection criteria, which mainly focuses on the lowest bidding price. However, selected contractors often propose solid waste disposal areas that are far from the community, resulting in higher transportation costs. Some municipalities have to transport their waste out of the municipal area and are unable to collect waste in time. Preliminary discussions with the governor of Samut Sakhon have been made in order to create solid waste management clusters and to find the closest waste disposal facility for local government organizations that do not have a sanitary solid waste disposal facility, to enhance waste management efficiency, to save waste disposal time and to reduce waste accumulation.

According to the above information local government organizations are still unable to provide adequate waste collection services, causing the accumulation of solid waste, especially in small communities. The disposal of solid waste was not technically correct. The routes of the solid waste collection were overlapping, resulting in high operating costs and wasted time. In addition, problems of accumulated waste, the absence of adequate waste bins and trucks, the lack of a maintenance budget and the lack of sanitary waste disposal facilities, especially with comprehensive waste management systems persist. Most of the collected waste is

disposed of in a landfill without any environmental protection measures, causing resistance from the local people.

(3) Public distrust and complaints against solid waste disposal facilities

In Samut Sakhon, there are five solid waste disposal facility projects managed by the local government organization. The first is the Solid Waste Disposal Center Project of Samut Sakhon Provincial Administrative Organization, Na Khok Subdistrict. The second is the Solid Waste Disposal Center Project of Samut Sakhon Provincial Administrative Organization, Ban Ko Subdistrict. The first two projects have not been constructed due to the opposition of the local people. The third is the Solid Waste Disposal Center of Aom Noi Municipality, which has already been constructed but cannot operate due to public opposition. The fourth is the Solid Waste Disposal Center of Ban Phaew Municipality, which was adapted from an old dumping ground but cannot operate due to the opposition. The fifth is the Dumping Ground of Mueang Samut Sakhon Municipality, which is currently closed due to full capacity. There is also one infectious waste disposal facility, which is out of service. In addition, there are four solid waste disposal facilities managed by private companies, including, 1) the Somnuk Business Ltd., Nadee Subdistrict, Mueang Samut Sakhon District Dumping Ground; 2) the Phanthai Recycle Co., Ltd., Phanthai Norasing Subdistrict Dumping Ground, the Mueang Samut Sakhon District Dumping Ground; 3) the Samut Sakhon Natural Clean Energy Co., Ltd., Bangthorad Subdistrict, Mueang Samut Sakhon District Dumping Ground, and; 4) the Rittana Reuse Co., Ltd., Ban Phaew Subdistrict, Ban Phaew District Dumping Ground. All active solid waste disposal facilities in Samut Sakhon are thus managed by private companies. From an interview with C. Boonprakhong (personal communication, August 3, 2020), Permanent Secretary of Samut Sakhon Municipality, the study finds that local people opposed the solid waste disposal facilities because many landfills are located near community areas and do not comply with sanitation standards, causing unpleasant odors to the surrounding areas.

2) Solutions

(1) Dividing responsibilities between regulators and operators

According to an interview with W. Wannuch (personal communication, November 29, 2020), Director of the Samut Sakhon Provincial Office for Local Administration, apart from integrating various agencies and resources related to solid waste management, the roles and responsibilities of regulators and operators should be clearly divided in order to avoid overlapping/duplicating tasks, which frequently occurs. A clear division of responsibilities would result in checks and balances and a better match between task and expertise. For example, the Provincial Natural Resources and Environment Office acts as a regulator providing environmental support and advice and promoting public participation in solid waste management, whereas the Provincial Office for Local Administration acts as an operator providing solid waste management knowledge and training to executives and employees in all kinds of local government organizations, including the PAO, the Municipality, and the TAO, so that they can transfer the obtained knowledge to the public and make local people recognize the importance of solid waste management through waste sorting before the disposal project that focuses on reducing, reusing, and recycling generated waste, sorting waste at the source, providing adequate waste bins and increasing the number of waste sorting bins.

(2) Creating clusters of local government organizations

Another important solution is creating solid waste management clusters. In Samut Sakhon, some local government organizations do not have their own solid waste disposal facility, and some have a solid waste disposal facility that do not meet sanitation standards. Solid waste transportation costs are high as most local government organizations are located far from the dumping grounds with the farthest distance up to 30 kilometers. Therefore, in order to enhance solid waste management efficiency, local government organizations in Samut Sakhon were grouped into FIVE clusters as follows:

(2.1) The Ban Phaew Municipality Cluster, which consists of 12 local government organizations;

(2.2) The Kalong Subdistrict Administrative Organization Cluster, which consists of 6 local government organizations;

(2.3) The Tha Chin Municipality Cluster, which consists of nine local government organizations;

(2.4) The Klong Maduea Subdistrict Administrative Organization Cluster, which consists of four local government organizations;

(2.5) The Na Di Subdistrict Municipality Cluster, which consists of four local government organizations.

However, C. Boonprakhong (personal communication, August 3, 2020), Permanent Secretary of Samut Sakhon Municipality, commented that the grouping of these clusters negatively affects the management of solid waste because it does not take into account the type of solid waste generated in each of Samut Sakhon's three districts. The Ban Phaew District mostly consists of agricultural areas so most of the waste generated is organic. The Krathum Ban District is mostly industrial and so mostly produces industrial waste which Mueang Samut Sakhon District mainly consists of residential areas with many government buildings and so produces mainly household waste. Understanding the different types of waste make the management of solid waste more efficient, both in terms of waste sorting and recycling.

Therefore, the governor of Samut Sakhon, as chairman of the Provincial Sewage and Solid Waste Management Committee, managed the regrouping of clusters by taking account of the context of each area. As a result, local government organizations in Samut Sakhon were regrouped into three clusters as follows: 1) Ban Phaew District, 2) Krathum Ban District, and 3) Mueang Samut Sakhon District. The criteria for the regrouping include the number of solid waste disposal facilities, the types of waste and distance. The regrouping of clusters helped to improve the efficiency of solid waste management in the province.

(3) Building public awareness and promoting the reduction of waste at the source

When asking W. Wannuch (personal communication, November 29, 2020), Director of the Samut Sakhon Provincial Office for Local Administration, about sustainable solutions to the problem of solid waste, she said that it is necessary to make the local people, as the source of waste generation, understand and participate in solid waste management. She commented that is

important to highlight the importance of reusing and recycling materials as well as reducing waste, to provide the local people with advertising media and training on convenient recycling methods, and to encourage the local government organization executives, community leaders, and natural resources and environmental protection volunteers (NEV) to visit waste separation plants in tourist-destination provinces in order to learn about solid waste disposal best practices and how to build trust and enhance public participation in the establishment of waste disposal facilities.

(4) Contracting out solid waste disposal services

Due to public opposition, at present, as indicated above, all solid waste disposal services in Samut Sakhon are managed by private companies. Recently, the Samut Sakhon Natural Clean Energy Co., Ltd. established a waste-to-energy plant, which is considered a prototype plant with a comprehensive solid waste management system in Samut Sakhon and is part of the pilot waste management project in the lower central provinces. A project to generate electricity from waste in the future is also planned. In addition, Mueang Samut Sakhon Municipality has signed a contract with a private company to build a waste separation plant that can separate and reduce the size and moisture of materials until they meet specified temperatures and conditions and can be conveniently transported to produce refuse-derived fuel (RDF).

However, C. Boonprakhong (personal communication, August 3, 2020), Permanent Secretary of Samut Sakhon Municipality, suggests that the contracting out process should be more transparent because in the past there were frequent complaints from local people regarding the disqualification of selected companies and odors emanating from solid waste disposal facilities. Therefore, local government organizations and related agencies have to make sure that all contractors strictly comply with the prescribed rules and regulations without disturbing surrounding communities and to ensure that tough penalties are in place – and enforced – for non-compliance.

Moreover, due to a policy that allows private companies to carry out solid waste disposal services through the contracting process, most local government organizations tend to select contractors based on the lowest bidding price. This makes the local people concerned about the efficiency and sanitation of solid

waste management. In addition, the selected contractors have to find new solid waste disposal areas that are far from the community, resulting in delayed waste collection and waste accumulation problems in the local areas. Thus, the governor of Samut Sakhon recently emphasized that contractor selection should focus more on the closest distance between local government organizations and the solid waste disposal areas in order to reduce transportation costs and to promote solid waste management efficiency.

(5) Collaboration between provincial and local government officials

C. Boonprakhong (personal communication, August 3, 2020), Permanent Secretary of Samut Sakhon Municipality, states that freedom from national politics, the strengths and capabilities of local government organization executives, and good relationships among local government officials are the key success factors in finding a solution to the solid waste problem. Other important factors are clear understandings of responsible staff in terms of the reduction of solid waste and public participation and the implementation of solid waste reduction and waste separation measures at the source. The success of solid waste management requires cooperation from all sectors and requires adequate time to create public awareness. If more waste is reduced at the source, less processing is needed further downstream.

7.2.2.2 Saraburi Province

Saraburi is a link between the central and northeastern regions of the country. It has a variety of historic sites and natural tourist attractions and is one of the leading industrial provinces of Thailand. According to the Office of the National Economics and Social Development Council, the gross provincial product in 2017 was 236,636.10 million Baht, which was the 14th highest of the country, with a real gross provincial product per capita of 330,749.52 Baht; the 10th highest of the country. The business sector, which is the key mechanism driving the economy of the province, is non-agricultural and includes the manufacturing sector, followed by wholesale and retail trade.

Saraburi possesses an area of 3,359.12 square kilometers, which is four times larger than Samut Sakhon and is 59th in terms of the size of all the provinces. It

is located 120 kilometers from Bangkok with its administrative areas divided into 13 districts, 109 local government organizations. It is comprised of one PAO, three Town Municipalities, 27 Subdistrict Municipalities, and 78 TAOs.

1) Problems and Obstacles

(1) Accumulated waste problem

Among all 109 local government organizations in Saraburi, 12 local government organizations have their own solid waste disposal facilities, 76 local government organizations transport waste to dispose of in other areas and 20 local government organizations provide no solid waste collection and disposal service. Local government organizations have the responsibility to manage waste collection routes and schedules (Jongyin, 2019) but each of them has a different waste collection capacity. Some local government organizations collect waste every day, while some of them collect waste every other day or more. Most of them use the same truck to collect waste from every household and public bins and then transport the collected waste to solid waste disposal areas without transferring the waste to another vehicle. Local people in the 20 local government organizations with no solid waste collection or disposal service have to collect their own solid waste and dispose of it according to traditional methods, which leads to a problem of accumulated waste.

(2) Insufficient waste disposal capacity of local government organizations

According to the information from the Saraburi Provincial Natural Resources and Environment Office and an interview with P. Lertrat (personal communication, January 14, 2021), Director of the Saraburi Provincial Office for Local Administration, there are 12 solid waste disposal sites managed by local government organizations and one private solid waste disposal site in Saraburi. Each of them has different characteristics and problems as follows:

(2.1) The Saraburi Municipality site is an open-air landfill site with a large accumulation of waste that will take a long time to degrade. There have been some complaints from the public, especially in the rainy season, because it is located not far from the community.

(2.2) The Phra Phutthabat Municipality site is also a landfill. The municipal employees and garbage collectors work together to separate

waste before burying the rest of it in a hole and covering it with soil in an unsanitary way. A new hole will be dug when the previous one is full. It is estimated that this site will be full in five years.

(2.3) The Na Phra Lan Municipality site is located behind the Phu Khae Botanical Garden so there have been no complaints from the local people. The waste piled up at this site is separated by garbage collectors before being burnt.

(2.4) The Pokpak Subdistrict Municipality site is a small solid waste disposal site. When the site is full, local government organizations must send the collected waste to be disposed of in neighboring facilities. A limited number of complaints from the local people have occurred because it is far from residential areas.

(2.5) The Mueang Khit Khin Subdistrict Administrative Organization site includes both a landfill site and a waste separation plant. The landfill site, which falls under the responsibility of the Mueang Khit Khin Subdistrict Administrative Organization, is unsanitary and currently full. The waste separation plant is managed by the PAO. The separation of solid and combustible waste as alternative fuel is conducted with the cooperation of Cement Thai Co., Ltd. The rest of the waste is used as a soil modifier. However, the site has insufficient capacity to manage incoming waste, resulting in the large accumulation of waste.

(2.6) At the Muak Lek Subdistrict Municipality site, collected waste is unsanitary buried in a hole and covered by soil. A new hole will be dug when the previous one is full. However, there has been no complaint from the local people because it is situated far from the residential area. Currently, the site is closed for improvements based on sanitation standards.

(2.7) The Phu Krang Municipality site is open-air where collected waste is dumped in this site before being disposed of. Some people come here to collect garbage that can be sold, while the rest is left unattended. This site is likely to last for another 2-3 years. Sometimes garbage fires occur for no reason, causing frequent complaints from the local people.

(2.8) The Tan Diao Subdistrict Administrative Organization site is where waste is buried and covered with soil in an unsanitary way. When the

previous one is full, a new hole is dug, as with some of the other sites discussed above. This site is expected to last more than 10 years. There have been no complaints from the local people because it is far from residential areas.

(2.9) At the Sub Sanun Subdistrict Administrative Organization, waste is stored before being burnt. People living nearby come here to look for garbage that can be sold. There have been no complaints from the local people.

(2.10) At the Lamphaya Klang Subdistrict Administrative Organization site, collected waste is stored before being burnt. Very few complaints have been received because it far from residential areas. Most complaints are regarding the smoke from burning waste and wastewater flowing into the local people's rice fields during the rainy season. This is because the site is located on a hill higher than the neighboring areas.

(2.11) At the Wang Muang Municipality site, collected waste is dumped before being burnt, which is unsanitary. As a result, it is temporarily closed for improving the waste disposal method. This site has received few complaints because it is far from the residential area.

(2.12) The Nong Khae Subdistrict Municipality leases an area of 15 rai to a private company in order to provide a solid waste disposal service. The private company uses the waste to produce energy. Currently, there is a problem of accumulated waste. If the problem is not fixed, this site may not be able to accept more waste. There have been few complaints from the local people because it is far from the residential area.

(2.13) The TPI Polene Public Co., Ltd. site disposes of waste collected from local government organizations in Saraburi and other provinces by using it to produce energy for cement production. So far, it has efficiently managed the waste collected from local government organizations. There have been some complaints regarding the solid waste odor. However, as this site is far from the community, so the problem is not serious.

Local government and private solid waste disposal sites in Saraburi have applied four solid waste disposal methods as follows: 1) Sanitary landfill: one solid waste disposal site 2) Control dump: one solid waste disposal site 3)

Open air dump and incineration: nine solid waste disposal sites 4) Waste to energy (combustible waste is separated and compressed): two solid waste disposal sites

Overall, the solid waste disposal sites in Saraburi largely use open air dumping and incineration methods, which are unsanitary. Moreover, many solid waste disposal sites are nearly full and may not be able to accommodate the increased amount of waste in the future. There is a large amount of waste scattered along roads, public places, abandoned private spaces, and even around the bins provided by local government organizations, causing unsightly conditions. Some places have become breeding grounds for disease. Another important problem is the dumping of hazardous waste together with other types of waste, which can cause risks. Related agencies should be prepared to deal with this problem as well.

(3) An increase in the amount of solid and industrial waste

Due to the expansion of the industrial sector, more people from other provinces have migrated to look for work in Saraburi, a province located in a key industrial zone with many industrial factories. As a result, the amount of household and industrial waste continues to increase. Although local government organizations have increased their budgets and manpower for the collection of waste, many of them are unable collect waste on time, causing the problem of accumulated waste and unpleasant odors. Thus, local government organizations have to set up waste bins in public places because local people refuse to place those bins in front of their houses.

(4) A lack of solid waste disposal efficiency

P. Lertrat (personal communication, January 14, 2021), Director of the Saraburi Provincial Office for Local Administration, states that due to water shortages in disposal areas, many local government organizations have to transport waste to disposal sites which are far away, resulting in higher operating costs. Some waste disposal sites are crowded with waste trucks that have to wait a long time before being able to dump the waste. Sometimes taking up to five to fourteen hours. Therefore, most of the trucks are unable to return to collect the waste in time, leading to further problems. In addition, the solid waste management of the local government organizations are mostly unsanitary. Some of them have waste

disposal areas but do not receive agreement from the local people and do not reduce waste by recycling.

According to an interview with S. Khemnak (personal communication, August 20, 2020), Mayor of Nong Khae Subdistrict, waste management problems in Saraburi are due to increases in the registered and unregistered populations, the expansion of the industrial sector, and the unsanitary waste management methods of most local government organizations. Some authorized solid waste disposal sites are not accepted by the local people and have no recycling process for waste reduction. In addition, local people still lack knowledge and understanding of how to recycle waste. Each household disposes of waste based on its own methods, such as open-air incineration and landfills, resulting in ineffective solid waste disposal. Many households with little space dump their waste in public places, causing unpleasant odors and unsightly conditions from the waste scattered along roadsides and abandoned private spaces.

2) Solutions

(1) Reducing waste at the source

P. Lertrat (personal communication, January 14, 2021), Director of the Saraburi Provincial Office for Local Administration, says that in order to solve the solid waste management problems in Saraburi, related agencies, including the Provincial Office for Local Administration, initially educated the local people on how to reduce waste at the source. However, in spite of these efforts if the amount of waste continues to increase, it will not be able to deal with solid waste problems in the future. The Provincial Office for Local Administration, the Provincial Natural Resources and Environment Office, and the Provincial Public Health Office – agencies directly involved in the management of solid waste – have tried to make the local people aware of the importance of solid waste management and have assigned local government organizations to promote public awareness of waste separation on a daily basis through public address systems and advertising billboards on the secondary roads. Additionally, they have carried out training by inviting speakers from public health and environmental agencies to provide current information, such as the problem of overflowing waste, public participation in solving solid waste problems based on the 3Rs principle (reduce, reuse, and recycle), and waste

separation, and also have organized visits to communities. Moreover, local government organizations have encouraged the establishment of a solid waste management group within the community in order for local people to jointly separate waste and to sell waste that can be recycled to a waste bank. In some communities, bio-fertilizer groups have been set up to produce bio-fertilizers from household waste before sharing with all group members.

However, P. Lertrat (personal communication, January 14, 2021), Director of the Saraburi Provincial Office for Local Administration, stated that there have been problems with training activities. As most of the training activities are short-term, the speakers tend to focus on providing knowledge without giving importance to practice, which is considered the key part. Some local people do not pay attention to the problem of solid waste but were asked to attend the training by community leaders. Moreover, training activities are not held on a regular basis. Most local people also take the view that solid waste disposal is the responsibility of local government organizations so they are not interested in learning about the topic. Most solid waste management groups have been established without the participation of the local people. Due to the urgency of solid waste management policies, solid waste management groups are not sustainable. When responsible officials no longer take any action, each group is likely to end all of its activities.

(2) Creating clusters of local government organizations

Apart from the above solutions, the following three clusters of local government organizations were created to increase the efficiency of solid waste management.

(2.1) The Saraburi Municipality, Chalerphra Kiat District Cluster, which consists of eight local government organizations. This cluster uses a sanitary landfill method to dispose of waste. It has a project to produce RDF from solid waste in the future.

(2.2) The Saraburi Provincial Administrative Organization, Ban Mo District Cluster, which consists of 15 local government organizations. This cluster disposes of waste using mixed methods. In the future, it aims to increase the capacity of machines in order to accommodate the higher amount of waste and to produce RDF for cement plants.

(2.3) The Phra Phutthabat Municipality, Phra Phutthabat District Cluster consists of 17 local government organizations. It uses an engineered landfill method to dispose of waste. In the future, it will build a waste separation plant that can produce RDF from solid waste in a joint investment with the private sector.

In addition, there are seven other organizations working on the disposal of solid waste, including: 1) TPI Polene Co., Ltd.; 2) the Tan Diao Subdistrict Administrative Organization, which collaborates with the Thailand Institute of Scientific and Technological Research to transform the existing open air dumping system into an integrated waste disposal system; 3) the Sub Sanun Subdistrict Administrative Organization; 4) the Lamphaya Klang Subdistrict Administrative Organization; 5) the Lam Som Phung Subdistrict Administrative Organization; 6) the Na Phra Lan Municipality; and 7) the Nong Khae Subdistrict Municipality.

However, it should be noted that the grouping of solid waste management clusters in Saraburi do not cover all local government organizations in the province, which are different from the grouping of clusters in Samut Sakhon. Both Saraburi and Samut Sakhon did not consider the types of waste, the distance between the local government organization and the solid waste disposal area or the transportation costs when grouping the clusters.

(3) Waste separation and recycling promotion

According to P. Lertrat (personal communication, January 14, 2021), Director of the Saraburi Provincial Office for Local Administration, the key factor affecting the success of waste management is waste separation at the source because it is a common way to reduce waste that local people can participate in. It also helps to reduce waste management costs and to generate income from the selling of separated materials. Apart from reducing waste, waste separation at the source can change the waste dumping behavior of local people. Separated materials can be recycled into various value-added products such as aprons from vinyl banners, hats from juice cartons and bags from coffee sachets or fabric softener bags.

K. Putthasorn (personal communication, August 20, 2020), Director of the Saraburi Provincial Natural Resources and Environment Office, stated that good solid waste management should begin with reducing solid waste generation,

separating and recycling solid waste, minimizing the amount of solid waste that must be disposed of and using modern technology to boost waste processing efficiency in an economical way.

(4) Having exemplary leaders and building public participation

S. Khemnak (personal communication, August 20, 2020), Mayor of Nong Khae Subdistrict, said the key success factors in solid waste management are the role of local government organization leaders in motivating the local people to recognize the importance of solid waste problems and public participation in waste reduction and separation at the source. Other related factors include the enthusiasm of responsible officials and their understandings of sanitary waste disposal methods appropriate for each type of waste, which is important (but not required) for sustainable solid waste management.

The “Clean City Project,” chaired by the governor of Saraburi, focuses on the management of community waste, and covers three phases as follows: first, creating public awareness on waste reduction, separation, and utilization; second, setting up hazardous waste collection points and establishing a solid waste collection systems based on the types of waste. Third, the sanitary disposal of solid waste, the promotion of waste disposal technology in each area and encouraging private investment in solid waste management in order to prevent the accumulation of waste.

There is currently a push to establish a solid waste management center in order to create public participation among people in neighboring areas. However, S. Khemnak (personal communication, August 20, 2020), Mayor of Nong Khae Subdistrict, stated that the success of this project depends on the ability of community leaders to make community members aware of – and participate in – solid waste management. As the central government has a limited budget and manpower to monitor the project, it will rely on the cooperation of the local government organization executives to build public awareness about the importance of the solid waste problem.

(5) Personnel development

P. Lertrat (personal communication, January 14, 2021), Director of the Saraburi Provincial Office for Local Administration, stated that an annual solid waste management workshops are held so that local government organizations, related government agencies, and high-potential private companies have the opportunity to learn about solid waste management policies and technical guidelines for solving solid waste problems, to exchange solid waste management knowledge and experiences, and to share solid waste management technology. In order to effectively develop solid waste management personnel, they should be provided with in-depth training on various topics, such as converting plastic waste into oil, producing biogas from organic waste, and producing food containers from agricultural waste, which can add value to solid waste.

(6) Creating partnerships with the private sector

Currently, no solid partnership between local government organizations and the private sector exists. Some relationships, however, exist between private companies that use the waste collected from Saraburi and neighboring provinces to produce refuse-derived fuel. S. Khemnuk (personal communication, August 20, 2020), Mayor of Nong Khae Subdistrict, indicated that the public-private partnerships on solid waste management in Saraburi mainly focus on sending the waste to industrial factories in order to produce alternative energy. The proportion of the waste sent to those factories is small compared to the total amount of waste generated. However, with the future expansion of industry and of the population, it is essential to increase partnerships between the public and private sectors because local government organizations have technological limitations and a shortage of capable solid waste management personnel.

3) Conclusion

From the above information, it is clear that the factors affecting the efficiency of solid waste management in Samut Sakhon and Saraburi can be summarized as follows:

(1) The adoption of new public management (NPM) practices to solve problems.

The key factor influencing the successful solid waste management of local government organizations in Samut Sakhon is the adoption of new public management practices to solve solid waste problems. One of the important strategies is to contract out solid waste disposal services to specialized private companies in order to efficiency and effectiveness. However, frequent complaints from the local people regarding the inefficiency of solid waste disposal services and waste accumulation problems are an ongoing issue.

C. Boonprakhong (personal communication, August 3, 2020), Permanent Secretary of Samut Sakhon Municipality, stated that after hiring private companies to carry out solid waste disposal services, the amount of waste accumulated in the municipal area significantly decreased, resulting in increased public satisfaction. In addition, the statistical data shown in Table 7.2 indicates that the amount of solid waste collected in Samut Sakhon increased by 2.5 times; from 377 tons per day in 2010 to 948 tons per day in 2017. On the other hand, the amount of solid waste collected in Saraburi increased by only 1.8 times from 372 tons per day in 2010 to 694 tons per day in 2017. This reflects the effectiveness of applying the new public management approach as an organizational management tool. The results are in line with previous research studies, which suggest that local people are more satisfied with the performance of local government organizations after the adoption of new public management practices (Boonyarittanon, 2008; Klongseubkao, 2010; Sutes, 2011).

Table 7.2 Amount of Solid Waste Collection in Samut Sakhon and Saraburi

Year	2010	2011	2012	2013	2014	2015	2016	2017
Samut Sakhon	377	422	665	665	890	950	970	948
Saraburi	372	415	685	685	624	681	747	694

Source: Department of Local Administration (2017)

As a result, Samut Sakhon has changed its solid waste management policy by contracting out all solid waste disposal services to private companies. If local government organizations are assigned to perform these tasks on

their own, they will have to cope with the problems of economy of scale and public opposition. C. Boonprakhong (personal communication, August 3, 2020), Permanent Secretary of Samut Sakhon Municipality, suggests that contracting out solid waste disposal services led to the termination of employment of solid waste collection employees of local government organizations. Therefore, Samut Sakhon has added new conditions requiring that selected contractors must hire existing solid waste collection employees as their staff members in order to avoid unemployment problems and downsizing the number of employees in local government organizations.

In Saraburi, local government organizations mostly carry out solid waste disposal tasks on their own, using an unsanitary landfill method. Some local government organizations encounter opposition from local people concerning new solid waste disposal sites to replace existing dumping grounds that are full. The problem of delayed waste collection causes some people to dump their household waste on roadsides and abandoned private spaces. Although some local government organizations in Saraburi send their collected waste to industrial factories in order to produce alternative energy, the proportion of the waste sent to those factories is small compared to the total amount of waste generated. S. Khemnakh (personal communication, August 20, 2020), Mayor of Nong Khae Subdistrict, commented that inefficient waste collection is partly due to government regulations, particularly because the wages of temporary employees cannot be increased or higher than those prescribed. Thus, solid waste disposal employees, who are mostly temporary employees, lack motivation to work. His comment reflects the fact that solid waste management by local government organizations in Saraburi is performed in compliance with government regulations rather than focused on outcomes; a core principle of the new public management approach.

(2) Participative and achievement-oriented leadership

The role of leaders is vital to the success of solid waste management as local government organizations in Samut Sakhon adopt new public management approaches. This is because leaders are responsible for determining organizational goals, visions, plans, designs, and management practices. Sonwa, Sutamdee, and Koawsa-ad (2018), who conducted a study on the characteristics of

leaders in modern government organizations, suggest that the key characteristics of modern leaders include participative leadership, which is associated with encouraging subordinates to express their opinions and motivating related parties to participate in decision-making and achievement-oriented leadership, which is concerned with setting challenging goals for subordinates and looking forward to the achievement of those goals. These characteristics are different from the characteristics of former public sector leaders.

The participative and achievement-oriented leadership of the high-level leaders in Samut Sakhon was clearly seen as they participated in regrouping the solid waste management clusters, which were previously divided by the Ministry of Interior into five groups as follows: 1) The Ban Phaew Municipality Cluster; 2) The Kalong Subdistrict Administrative Organization Cluster; 3) The Tha Chin Municipality Cluster; 4) The Klong Maduea Subdistrict Administrative Organization Cluster, and; 5) The Na Di Subdistrict Municipality Cluster. The grouping of these five clusters negatively affects the management of solid waste because it did not take into account the type of solid waste generated and the distance between local government organizations and the solid waste disposal sites, causing higher transportation costs, delayed waste collection, and waste accumulation problems. Moreover, the increased distance to the waste disposal sites made more local people suffer from the unpleasant odors from the waste. Therefore, the leaders of local government organizations in Samut Sakhon held a meeting to discuss the problem at the municipal and district levels and submitted the solutions to the provincial administrators for approval.



Figure 7.1 Classification of Three Solid Waste Management Clusters in Samut Sakhon

Source: Samut Sakhon Provincial Office for Local Administration (2017)

The Samut Sakhon governor, as Chairman of the Provincial Sewage and Solid Waste Management Committee, showed his participative and achievement-oriented leadership by holding a meeting with related parties, including the Director of the Provincial Office for Local Administration, the Director of the Provincial Natural Resources and Environment Office, and the administrators of all local government organizations in Samut Sakhon, in order to discuss the regrouping of solid waste management clusters based on the needs of the local people in order to optimize the efficiency of solid waste management. As a result, local government organizations in Samut Sakhon were regrouped into three clusters as follows:

(2.1) The Ban Phaew Subdistrict Administrative Organization Cluster (Zone A) in Ban Phaew District, where the solid waste disposal service is provided by Rittana Reuse Co., Ltd.

(2.2) The Kalong Subdistrict Administrative Organization Cluster (Zone B) in Mueang Samut Sakhon District, where the solid waste disposal service is provided by Samut Sakhon Energy Co., Ltd.

(2.3) The Na Di Subdistrict Municipality Cluster (Zone C) in Krathum Ban District, where the solid waste disposal service is provided by Somnuk Business Ltd.

Figure 7.1, shows the regrouping of the clusters, considering the type of solid waste generated in each of the three districts and the distance between the local government organization and the solid waste disposal site. The success of the solid waste management in Samut Sakhon is due to the participation of the leaders in problem-solving and responding to the needs of local government organizations based on the concept of management efficiency and participative and achievement-oriented leadership. On the contrary, the role of leaders in solid waste management was not clearly seen in Saraburi. Although three solid waste management clusters were established, they cover only 50 out of 109 local government organizations in Saraburi. This indicates that more than half of local government organizations are not included in the grouping of solid waste management clusters, which may affect the efficiency of solid waste management in the next phase. The provincial administrators and the leaders of local government organizations in Saraburi have thus far not taken any step to establish additional solid waste management clusters. Local government organizations that are not included in the existing three clusters have to find a way to manage solid waste by themselves.

(3) Public participation in solid waste management

Good governance is one of the key elements of the new public management approach focusing on the implementation of public policy and public participation in order to create a transparent and accountable work process. In addition, Section 3/1 of the 2002 State Administration Act (No.5) specifies that government agencies shall apply the methods for good administration of state affairs in performing their duties, and in particular to take into account the responsibilities of officers, the participation of people, the disclosure of information, and the monitoring and assessment of outcomes of the work as appropriate for each task. The nature of public participation varies according to the political, economic, social, and cultural contexts of each locality. Moreover, public participation can be categorized into different levels based on its impacts on public operations. The International Association for Public Participation (IAP2) divides public participation into five

levels, arranged in ascending order as follows: 1) inform, 2) consult, 3) involve, 4) collaborate, and 5) empower.

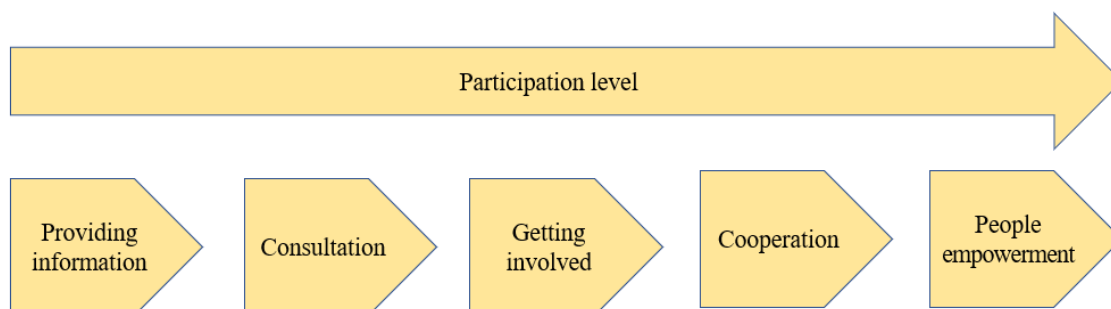


Figure 7.2 Public Participation Levels

Source: International Association for Public Participation (n.d.)

As a figure 7.2, Throughout first two levels of public participation (inform and consult), local people in Samut Sakhon and Saraburi participated in solid waste management. Local government organizations and provincial agencies provided solid waste management knowledge to the local people through various channels, such as village broadcasting systems, formal announcements, and websites. Related government agencies also organized training activities to educate local people on how to reduce, reuse, and recycle solid waste. These activities are a fundamental tool for enhancing community participation.

However, at the higher levels of public participation (involve, collaborate, and empower), the local community in Samut Sakhon showed greater participation in solid waste management in terms of expressing their opinions about the establishment of solid waste disposal facilities, the efficiency of solid waste management, high operating costs and the lack of transparency in the hiring process of solid waste management.

C. Boonprakhong (personal communication, August 3, 2020), Permanent Secretary of Samut Sakhon Municipality, shared that the local community in Samut Sakhon actively participates in solid waste management because Samut Sakhon has experienced serious solid waste management problems, such as waste accumulation, unsanitary waste disposal, waste odor, and unsightly waste areas.

The construction of the five waste disposal sites by local government organizations cannot be carried out due to public opposition. Moreover, industrial factories that generate both organic and industrial waste, have caused adverse environmental impacts. These factors have made local communities in Samut Sakhon Province more alert to solid waste management issues compared to the communities in Saraburi Province, which has experienced fewer solid waste problems.

Another example that clearly reflects public participation in solid waste management is the establishment of the natural resources and environmental protection volunteers. Natural resources and environmental protection volunteers are local people in the village or community, who are interested in and dedicated to protecting, preserving, and restoring their natural resources and environment in a sustainable way. Their main duties are 1) to enhance strength, learning process, and self-reliance of the community concerning sustainable natural resource and environmental management, 2) to coordinate the management of natural and environmental resources at the policy and community levels, and 3) to promote public participation in the conservation and rehabilitation of natural and environmental resources at all levels.. Table 7.3 shows the numbers of the natural resources and environmental protection volunteers in Samut Sakhon Province is greater than that in Saraburi Province at the district, subdistrict, and village levels. indicating that communities in Samut Sakhon Province are more alert and aware of the importance of natural resource and environmental issues, including solid waste problems.

Table 7.3 Number of Natural Resources and Environmental Protection Volunteers (NEV)

Province	Samut Sakhon			Saraburi		
	District	Subdistrict	Village	District	Subdistrict	Village
Total	3	40	290	13	111	973
Having the NEVs	3	38	164	13	91	348
Percentage	100%	95%	57%	100%	82%	36%

Source: Ministry of Natural Resources and Environment, Department of Environmental Quality Promotion (DEQP) (n.d.)

The results of this research are in line with the findings of (Aimkitpaisal, 2016) on the relationships between the community strength and environmental quality which suggest that allowing local communities, who are the owners of local resources, to form a working group to preserve natural and environmental resource is an important mechanism for promoting community environmental management and creating a good environment within the community. Some localities create their own community development plan, determine environmental development guidelines and activities, and hold regular meetings (at least three times per month) in order to share ideas and opinions among people in the same community. This reflects the success in solving solid waste management problems. In addition, effective communication, adequate access to information, a participatory process that fosters public participation, and a positive attitude towards the public participation process of government agencies and local government leaders are the important factors motivating people to participate in solid waste management and treatment.

The government has a policy to decentralize powers to the local government organization because it is considered the governmental agency that is closest to the people. The 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act was established to be used as a guideline for political, administrative, and fiscal decentralization according to the spirit of Thai Constitution. This act especially focuses on the transfer of public service missions from the central government to the local government organization.

One of the key public service missions that the central government has transferred to the local government organization is solid waste management, as it is the basic public service that must be provided to all localities. According to Section 16 (18), 17 (11), and 18 of the 1999 Determining Plan and Procedures in Decentralization to the Local Government Organization Act, municipalities, Pattaya City, Tambon administrative organizations, provincial administrative organizations, and Bangkok are responsible for the disposal of solid waste, sewage, and wastewater. Based on the principles of fiscal decentralization, if local administrators who are locally elected and truly understand the needs and problems of local people are allowed to determine a revenue and expenditure fiscal policy for solid waste management, it will result in a more effective policy implementation. If the

determined fiscal policy is inconsistent with the needs of local people, it may affect the next local election.

Although, in principle, fiscal decentralization has an effect on the efficiency of solid waste management as mentioned above, it is not a guarantee of success in solving solid waste problems. The success of solid waste management depends on various factors and is associated with the objectives of fiscal decentralization. According to the comparative analysis of the local government capacity for solid waste management in Samut Sakhon and Saraburi, it was found that the key success factors of the local government organizations in Samut Sakhon are the adoption of new public management practices, public participation, and participative and achievement-oriented leadership. Another important success factor is policy learning, which occurs when policy makers study and compare one set of policy problems to others and then draw lessons to be used as a guideline for effective policy decisions.

In Samut Sakhon, policy learning is part of the policy process that continues to develop. Samut Sakhon was once an important agricultural source of the country, where most of the people depended on agriculture and fishing for livelihood. However, due to economic changes, Samut Sakhon has become the center of fresh food and seafood and the industrial city with a number of Thai and foreign laborers. Traditional and low-technology landfill methods cannot be used to handle the rapidly increased amount of solid waste. When the solid waste problems began to exceed the local government capacity, the local government organizations in Samut Sakhon determined a policy to establish new solid waste disposal centers in 2005. However, the construction of the Solid Waste Disposal Center Project in Nakhok Subdistrict (a project value of approximately 1,559 million baht) and the Solid Waste Disposal Center Project in Ban Ko Subdistrict (a project value of approximately 470.6 million baht) was cancelled due to the opposition of the local people regarding the operational transparency and the odor and wastewater problems that may affect surrounding communities. The opposition of the local people has obstructed the establishment of other solid waste disposal facility projects as well.

Thus, the local government organizations in Samut Sakhon use policy learning to determine the solutions to this problem, consisting of the following two main approaches. First is reducing waste at the source. As this approach requires

cooperation from the local people to reuse and recycle generated waste, the local government organizations have to make the local people aware of the importance of solid waste and environmental problems and provide them with knowledge on how to reuse and recycle waste. Second is establishing comprehensive waste disposal facilities. This approach can completely solve the problem but it requires a high investment budget and also needs approval from the local people. The past problem-solving experiences, key success factors, key failure factors, and best practices are used to draw key lessons for solving solid waste problems as follows.

1) Establishing a solid waste disposal facility without reducing waste at the source cannot sustainably solve solid waste problems. Therefore, the most important thing is to build public awareness and understanding, promote public participation in reducing waste at the source, and encourage waste reuse and recycling by making the local people recognize the importance of solid waste reduction and providing them with training activities and informative advertising. At present, there are many local government organization executives in Samut Sakhon that have continuously implemented this measure. In order to achieve sustainable operations, it is necessary to build a network of cooperation within and between communities, which will lead to effective knowledge sharing on waste recycling and generating income from recycled waste. This is because the government has limited budget and manpower to support communities on a continuous basis.

2) Due to their previous failures in solving solid waste problems and limited solid waste management capacity, the local government organizations decide to contract out solid waste disposal services to private companies, which helps to increase solid waste management efficiency and public satisfaction. However, there are public complaints about the transparency of the contracting out process. Therefore, the local government organizations apply policy learning to improve the transparency and accountability of the contracting out process by encouraging public participation and informing the local people about related factual information in order to build trust and collaboration.

3) The local government organization executives have visited many waste separation plants in order to share knowledge and learn about solid waste disposal best practices useful for establishing waste disposal plants in Samut Sakhon.

For example, they visited Phuket's prototype waste separation plant and learned that building a waste disposal plant in a tourist-destination area is possible, but it requires cooperation from public, private and civil society networks. Phuket is an exemplary province for good solid waste management and electricity generation. It is the first province to establish a large incinerator. Thus, it will be helpful for Samut Sakhon to learn from Phuket's success. In addition, the local government organization executives visited a waste-to-energy plant in Bangkok to learn how to produce alternative energy from solid waste, which is more sustainable than traditional energy.

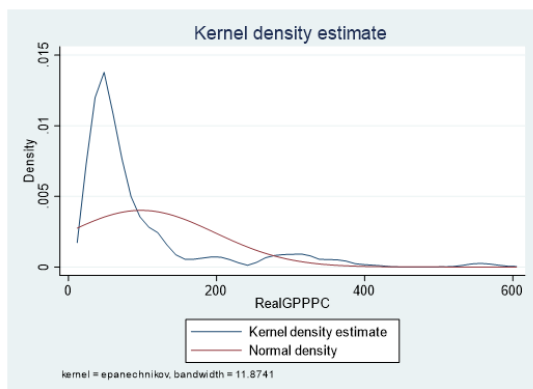
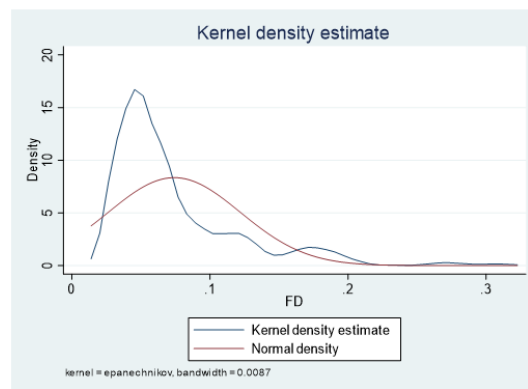
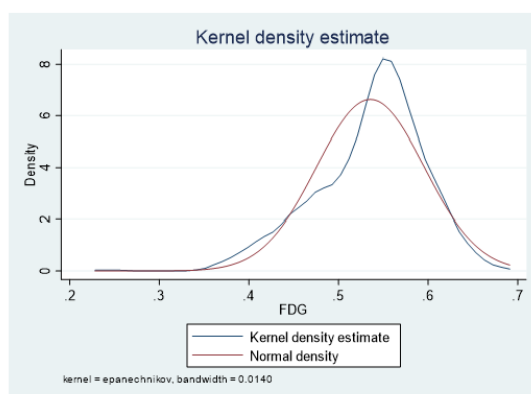
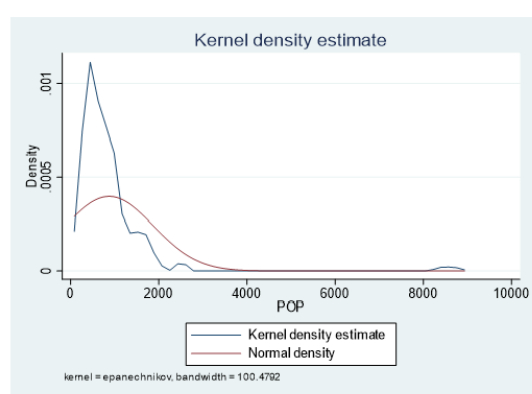
As a result, a waste-to-energy plant was successfully established in Samut Sakhon as a prototype plant with a comprehensive solid waste management system. This plant is part of the pilot waste management project in the lower central provinces. There is also a project to generate electricity from waste in the future as well. Moreover, Samut Sakhon Municipality has signed a contract with a private company to build a waste separation plant that can separate and reduce the size and moisture of materials until they meet specified temperatures and conditions and can be conveniently transported to produce refuse-derived fuel (RDF).

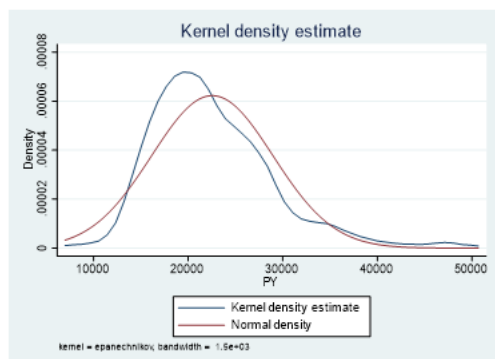
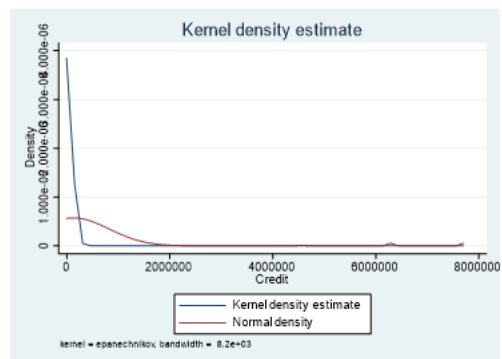
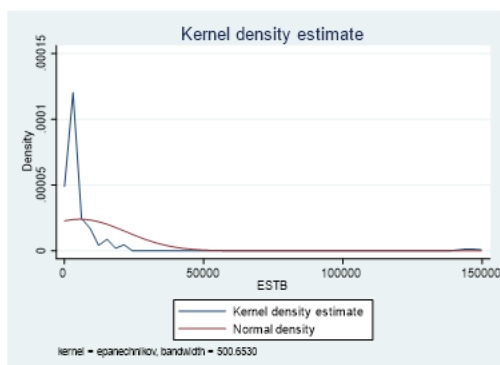
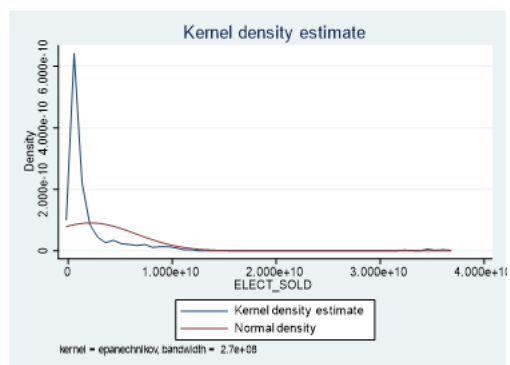
7.3 Results of the Statistical Analysis

7.3.1 Descriptive Statistics

The 2010-2017 data of the independent and dependent variables, which were used in this study, includes real gross province product per capita (realGPPPC) and inclusive growth (IG) which consist of two variables; 1) realGPPPC compare with Gini Coefficient (IG1); and 2) realGPPPC compared with the number of poor people (IG2), fiscal decentralization, excluding grants (FD), fiscal decentralization, including grants (FDG), the size of the population (POP), household income (PY), credits of commercial banks (credit), number of business establishments (ESTB), amount of electricity distribution (ELECT_SOLD), number of tourists (No_TOURISM), and performance of the local government organization, comprising efficiency (EFF) and productivity (PDT). The basic statistics for the analysis of each topic included mean, median, maximum, minimum, standard deviation, skewness, and kurtosis, as detailed in Table 7.4.

The distribution of the variables based on overall skewness or asymmetry from the 13 independent and dependent variables reveals that 11 variables are skewed to the right, with a level of higher than zero. These are: 1) real gross province product per capita (realGPPPC); 2) fiscal decentralization, excluding grants (FD); 3) size of the population (POP); 4) household income (PY); 5) credits of commercial banks (Credit); 6) number of business establishments (ESTB); 7) amount of electricity distribution (ELECT_SOLD); 8) number of tourists (No_TOURISMM); 9) efficiency of the local government organization (EFF); 10) productivity of the local government organization (PDT); and 11) number of poor people (No_Poor). However, fiscal decentralization, including grants (FDG) and Gini Coefficient (Gini) are skewed to the left since it had a skewness level of lower than zero. All of the variables had higher kurtosis than three for distribution of the variables, as detailed in Figure 7.3.

Real GPPPC**FD****FDG****POP**

PY**Credit****ESTB****ELECT_SOLD**

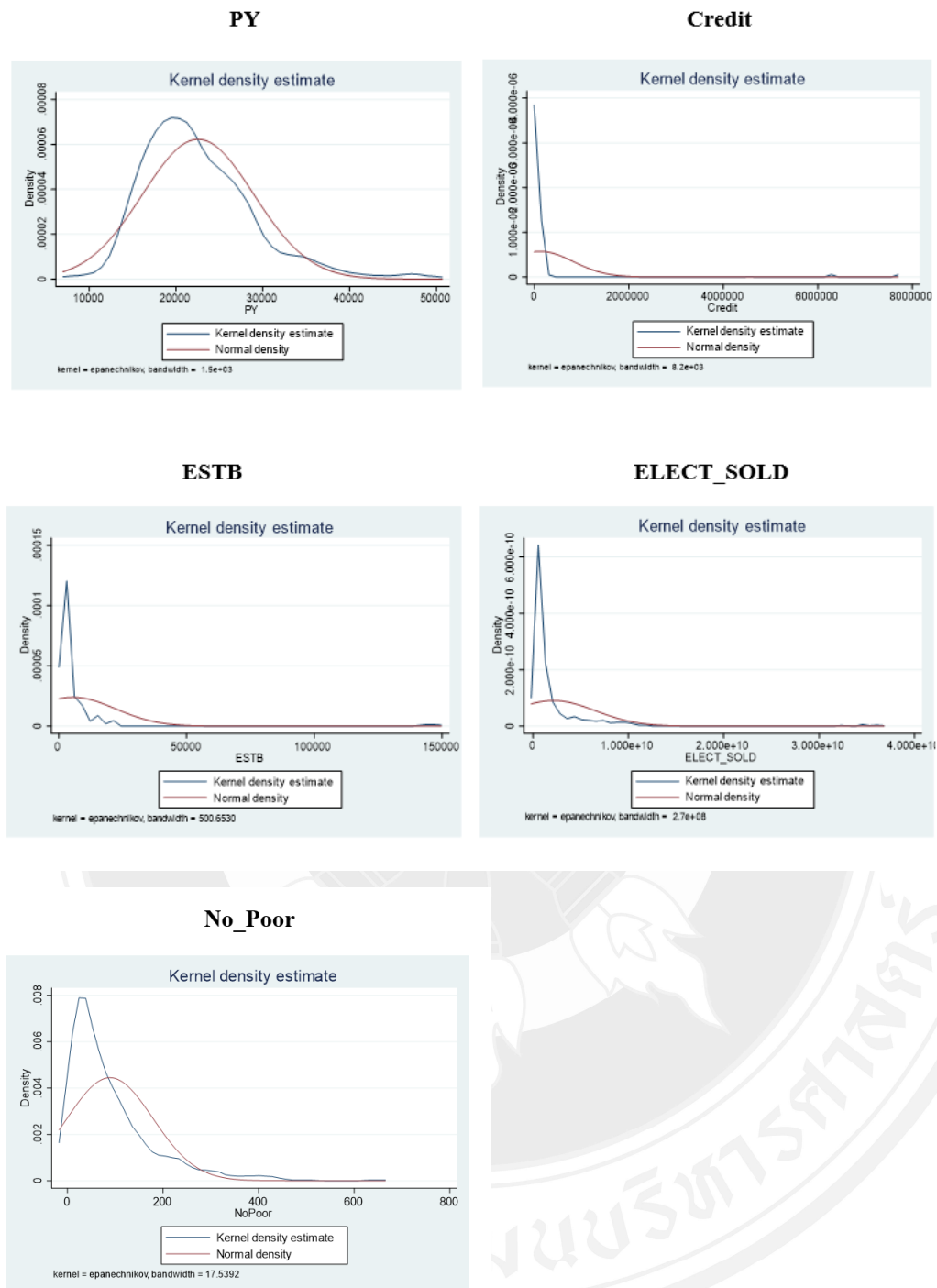


Figure 7.3 Distribution of Variables

Table 7.4 Descriptive Statistics

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
real GPPPC (billion Baht)	98.16	59.30	593.21	23.69	99.49	2.41	9.01
Gini Coefficient	32.17	32.33	45.00	16.20	4.05	-0.34	0.56
Number of Poor People (thousand)	89.11	58.98	647.92	0.00	89.73	1.99	5.22
FD (percentage)	0.0742	0.0578	0.3140	0.0226	0.0478	1.96	7.44
FDG (percentage)	0.5355	0.5455	0.6772	0.2423	0.0602	-0.67	3.70
POP (1,000 persons)	875.71	671.27	8,832.48	185.29	1,003.00	6.00	45.81
PY (1,000 Baht)	22.55	21.34	49.19	8.48	6.41	1.17	5.14
CREDIT (billion Baht)	124.43	23.15	7,692.57	1.98	695.62	8.76	79.95
ESTB (place)	5,523.48	2,196.00	49,165.00	585.00	16,577.09	7.80	65.48
ELECT_SOLD (million kilowatts per hour)	2,144.18	750.77	36,525.45	87.98	4,388.95	5.62	40.54
No_TOURISM (millions)	2,919.19	1,404.02	63,575.74	163.37	6,172.97	6.93	57.59
EFF	1.0008	1.0000	1.2682	0.7459	0.0508	0.1066	7.9223
PDT	1.1790	1.0814	3.7259	0.1449	0.4316	2.0434	6.5254

The details and analysis of the characteristics of the variables are laid out below:

1) Variable of Fiscal Decentralization (FD, FDG)

The variables of fiscal decentralization, comprising FD and FDG, are the main variables in this research. When comparing the nature of the distribution between the FD, which considers the locally levied revenue by the local government organization in comparison with the total revenue, and the FDG, which considers the locally levied revenue and grants by the local government organization in comparison with the total revenue, the study finds that the grants from the central government considerably affect changes in the distribution of both variables and caused the mean and median decrease from 0.0578 percent to 0.5455 percent and from 0.0742 percent to 0.5355 percent, respectively. Grants from the central government also altered the right-skewed distribution of 1.96 to the left-skewed distribution of 0.67 and the kurtosis of 7.44; higher than the normal curve and represents a small distribution, to the kurtosis of 3.70, which is similar to the normal curve and represents a normal distribution. These results suggest that grants from the central government are key factors influencing more normal distribution of the FDG variable.

In addition, the grants from the central government to the local government organization partly resulted in more income distribution, which can be described using the Lorenz curve, which represents the relationship between the percentage of the accumulated revenue and the percentage of accumulated population. It indicates what percentage of each population receives what percentage of the total income. If the income distributions are equal, the percentage of the population would equal the percentage of income. In this case, Lorenz curve would be on a 45-degree incline whereby the vertical axle represents the percentage of accumulated income and the horizontal axle represents the percentage of the accumulated number of households. Normally, the Lorenz curve would be a curved line. In other words, the more acute the Lorenz curve, the greater is the inequality of income distribution. On the other hand, the shallower the Lorenz curve, the less is the inequality of income distribution. Upon consideration of the Lorenz curve of FD in comparison with the Lorenz curve of FDG, the study finds the curve closer to 45 degrees line, as shown in the figure. When the revenue collected by the local government organization is

combined with the grants received from the central government, better local income distribution in comparison with only revenue collected by the local government organization is observed, as shown in Figure 7.4.

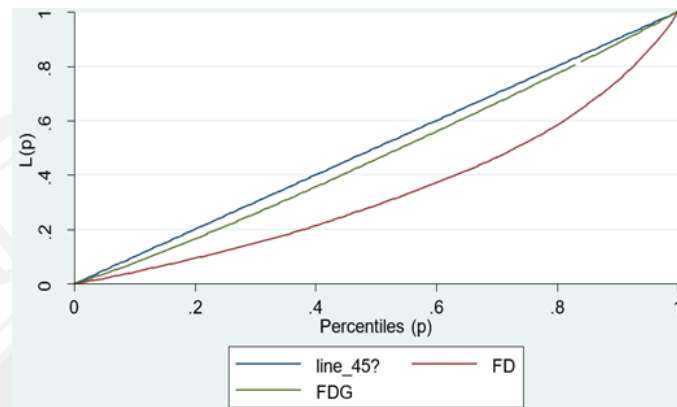


Figure 7.4 Lorenz Curve of the Variable of Fiscal Decentralization, Excluding Grants (FD) and the Variable of Fiscal Decentralization, Including Grants (FDG)

2) Number of Tourists (No_TOURISM)

This research assumes that the number of Thai and foreign tourists has a significant impact on the economic development of the provinces, as can be seen from a cursory look at recent years whereby local government organization executives have tried to promote tourism by arranging activities and annual festivals to attract tourists. According to information from 2017 from the Office of Permanent Secretary of Ministry of Tourism and Sports, the top three provinces visited by tourists include Bangkok, Chon Buri, and Phuket, with 63.58 million, 17.40 million and 14.01 million tourists, respectively. However, the three provinces visited the least by tourists were Pattani, Amnat Charoen, and Nong Bua Lamphu, with 0.27 million, 0.31 million and 0.38 million tourists, respectively.

However, when the number of tourists is compared with the size of the population the top three provinces with the largest proportion include Phuket, Phetchaburi, and Krabi with ratios of tourists per 1,000 residents at 26,050.50, 18,269.53 and 17,577.77, respectively. The three provinces with the lowest

proportions include Pattani, Nong Bua Lamphu, and Maha Sarakham, with 432.77, 797.56, and 709.67, per 1,000, respectively. This distribution is illustrated in Figure 7.5.

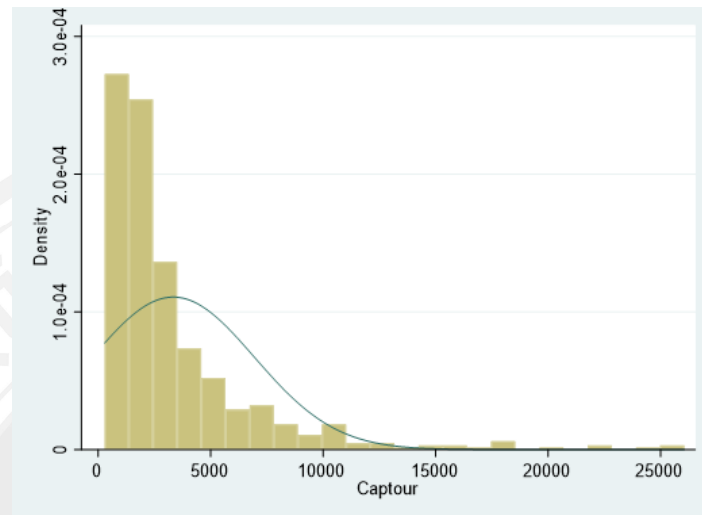


Figure 7.5 Proportion of Tourists to 1,000 People within Provinces from 2010-2017

3) Amount of Electricity Distribution (ELECT_SOLD)

Based on the hypothesis of this research, the amount of electricity distribution significantly affects economic development within provinces. According to information from 2017 from the Provincial Electricity Authority and Metropolitan Electricity Authority, the top three provinces with the highest amount of electricity distribution are Bangkok, Chon Buri, and Rayong with a total amount of electricity distribution of 36,210.64 million kW per hour, 11,981.96 million kW per hour, and 10,810.23 million kW per hour, respectively. The three provinces with the lowest amount of electricity distribution are Mae Hong Son, Amnat Charoen, and Uthai Thani with a total amount of electricity distribution of 124.64 million kW per hour, 205.75 million kW per hour, and 283.13 million kW per hour, respectively.

Based on the proportion of the electricity distribution in comparison with the size of the population in 2017, the top three provinces with the largest proportion are Rayong, Saraburi and Samut Sakhon, with ratios of electricity distribution per 1,000 people of 12.03 million kW per hour, 8.96 million kW per hour, and 8.29 million kW per hour, respectively. The three provinces with the lowest

proportion include Nara Thiwat, Nong Bua Lamphu, and Mae Hong Son with ratios of electricity distribution per 1,000 people of 0.58 million kW per hour, 0.60 million kW per hour, and 0.63 million kW per hour, respectively. This distribution is illustrated in Figure 7.6.

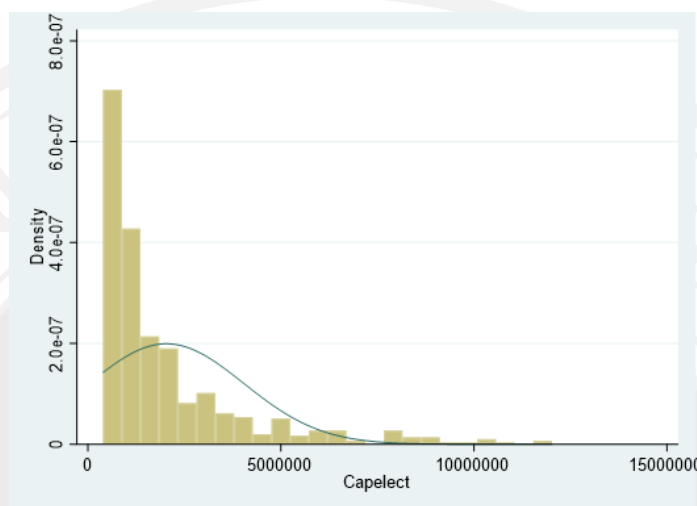


Figure 7.6 Proportion of Electricity Distribution to 1,000 People within Provinces from 2010-2017

4) Household Income Per Capita (PY)

The monthly household income per capita has a significant impact on economic development in the provinces. The economic principles suggest that when people have more income, they will consume more products and services, which may lead to economic growth. According to information from 2017 from the Office of Permanent Secretary of Ministry of Tourism and Sports, the top three provinces with the highest monthly household income per capita are Bangkok, Pathum Thani, and Nonthaburi with an income of 45,707.31 Baht, 41,483.71 Baht, and 40,860.88 Baht, respectively. The three provinces with the lowest monthly household income per capita are Phayao, Kalasin, and Chiang Rai with an income of 11,808.93 Baht, 14,263.81 Baht, and 14,593.62 Baht, respectively.

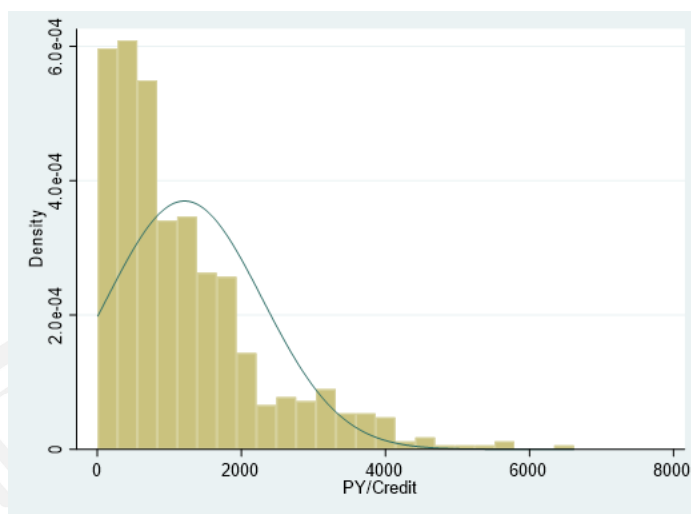


Figure 7.7 Proportion of Monthly Household Income to the Amount of Credits of Commercial Banks from 2010-2017

The proportion of monthly household income to the amount of credit of commercial banks in 2017 show that the top three provinces with the highest proportion are Mae Hong Son, Ranong and Trad with a ratio of monthly household incomes to the amount of 1 million Baht of credit at commercial banks of 3,471.32 Baht, 3,444.02 Baht, and 3,443.59 Baht, respectively. The three provinces with the lowest proportions are Bangkok, Chon Buri, and Chiang Mai with a ratio of monthly household income per 1 million Baht of credit at commercial banks of 5.94 Baht, 75.19 Baht and 3,443.59 Baht, respectively. This distribution is illustrated in Figure 7.7.

5) Amount of Credits of Commercial Banks (Credit)

The amount of credit of commercial banks significantly affects economic development of Thailand's provinces. According to 2017 information from the Bank of Thailand, the top three provinces with the highest amount of credits of commercial banks included Bangkok, Chon Buri, and Samut Prakan with the total amount of credits of commercial banks of 7,692.57 billion Baht, 367.92 billion Baht, and 242.92 billion Baht, respectively. The three provinces with the lowest amount of credits of commercial banks included Mae Hong Son, Uthai Thani, and Satun with the total amount of credits of commercial banks of 4.50 billion Baht, 6.92 billion Baht, and 6.99 billion Baht, respectively.

Upon the analysis of the proportion of the amount of credits from commercial banks to 1,000 people of each province in 2017, it was found that the top three provinces with the highest proportion included Bangkok, Chon Buri, and Samut Prakan with the proportion of the amounts of credits from commercial banks to 1,000 people at 870.94 million Baht, 336.71 million Baht, and 219.09 million Baht, respectively. The three provinces with the lowest proportion included Uthai Thani, Trad, and Samut Sonkhram with the proportion of the amount of credits from commercial banks to 1,000 people at 12.81 million Baht, 18.88 million Baht, and 22.65 million Baht, respectively. Upon consideration of the overall proportion of the amount of credits of commercial banks to the size of the population within all provinces from 2010-2017, the distribution is illustrated in Figure 7.8.

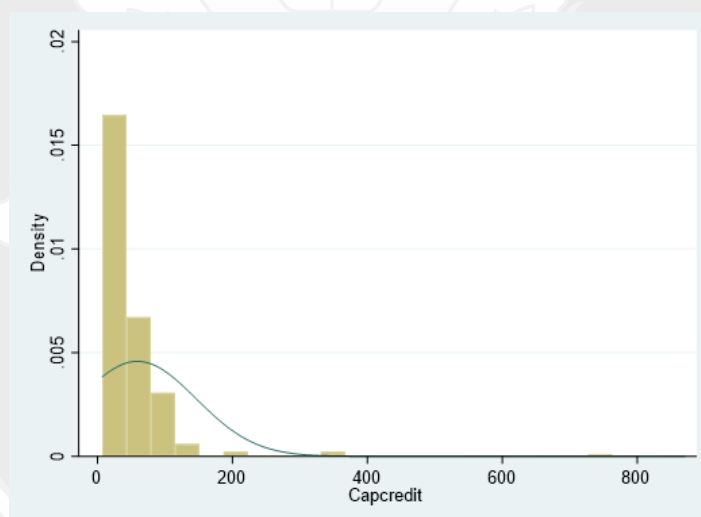


Figure 7.8 Proportion of Amount of Credits of Commercial Banks to 1,000 People in Provinces from 2010-2017

6) Number of Business Establishments (ESTB)

Based on the assumption of this research, it was determined that the business establishments significantly affects the economic development of the provinces. According to the information from 2017 from the Bank of Thailand, it was found that the top three provinces with the most business establishments included Bangkok, Chiang Mai, and Samut Prakan with the total number of business

establishments of 149,165, 23,084, and 21,676 places, respectively. The three provinces with the least business establishments included Samut Songkhram, Buriram, and Nakhon Phanom with the total number of business establishments of 617, 715 and 795 places, respectively.

Upon the analysis of the proportion of the number of business establishments to 1,000 people of each province in 2017, it was found that the top three provinces with the highest proportion included Chon Buri, Bangkok, and Samut Prakan with the ratio of the number of business establishments to 1,000 people at 19.67, 16.89 and 12.90 places, respectively. The three provinces with the lowest proportion included Nakhon Phanom, Yala, and Nong Khai with the ratio of the number of business establishments to 1,000 people at 1.69, 1.74 and 2.02 places, respectively. Upon consideration of the overall proportion of the number of business establishments to 1,000 people within all provinces from 2010-2017, the distribution is illustrated in Figure 7.9.

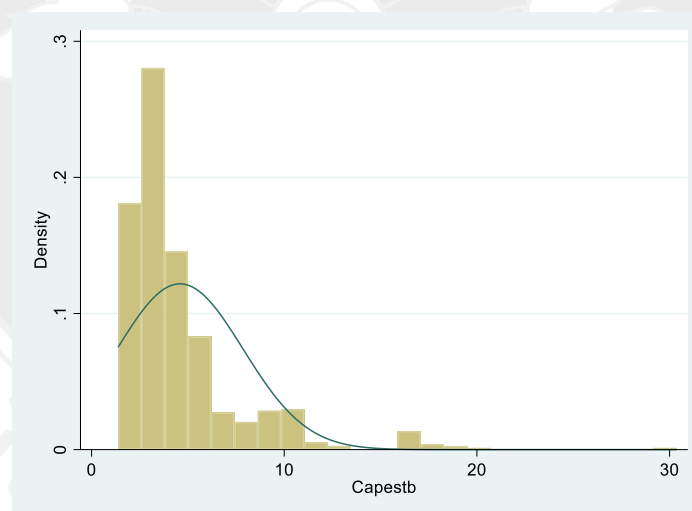


Figure 7.9 Proportion of the Number of Business Establishments to 1,000 People in Provinces from 2010-2017

7.3.2 Diagnostic Testing

Regression analysis is the study of the connection between the dependent and independent variables. In order to implement this methodology, it was necessary to

determine various agreements to control the movement of the residual variables. In addition, in testing the relationship of the regression analysis, it was necessary to determine the conditions to control the variables according to the agreement. If any discrepancies were found, the model needed to be revised to ensure conformity otherwise the research results would deviate, leading to inappropriate determination of policies.

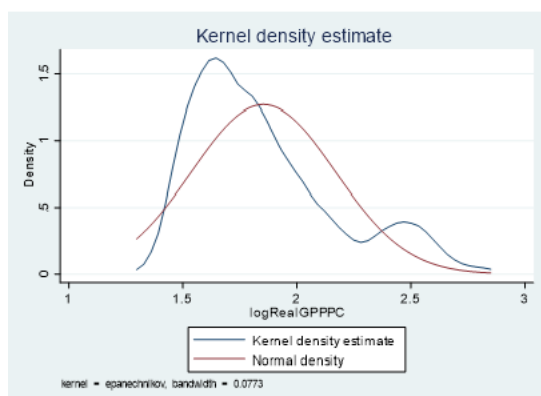
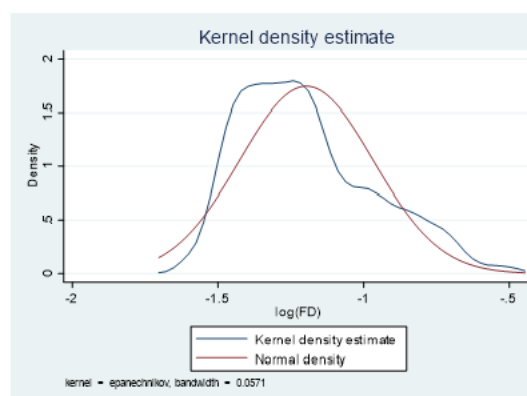
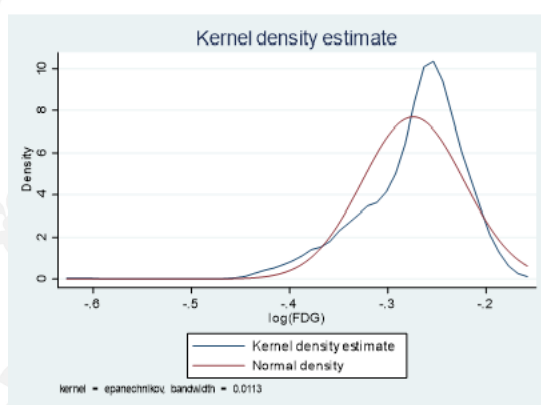
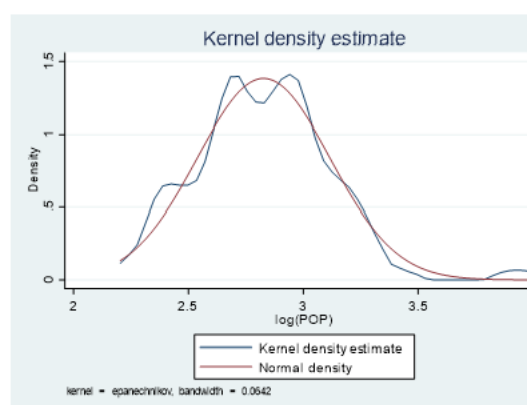
The estimation of the regression equation and hypothesis testing of the variables was conducted according to the following steps.

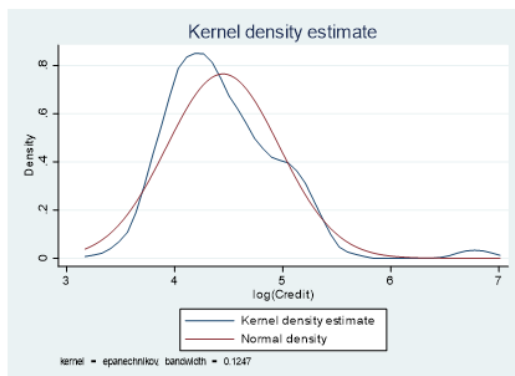
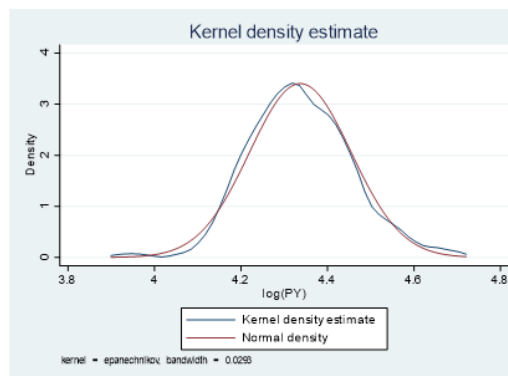
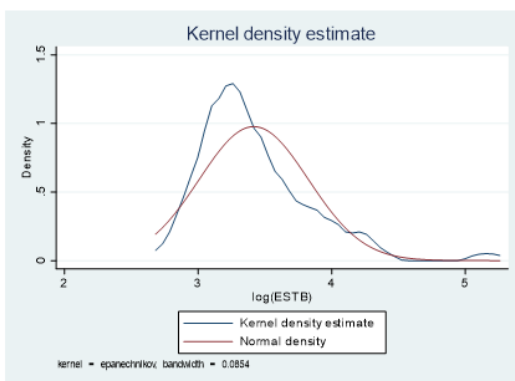
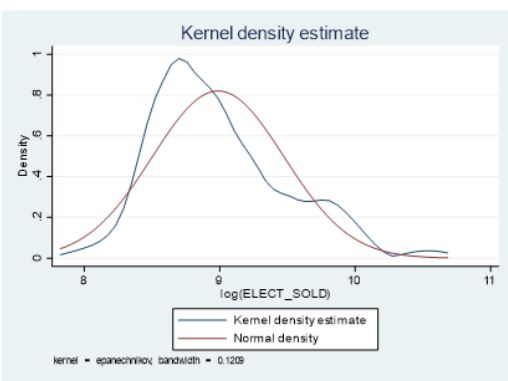
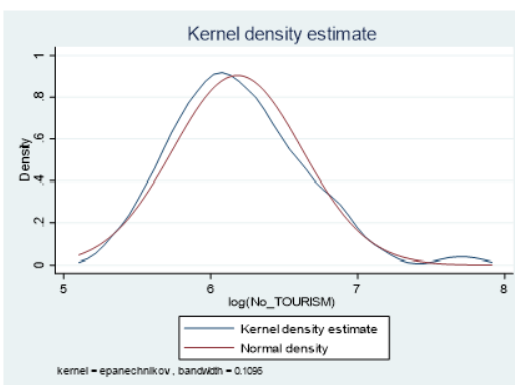
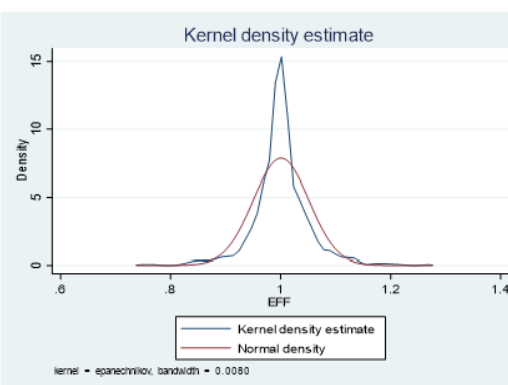
7.3.3 Multicollinearity Test

It is a problem when there is a relationship between more than two independent variables, and the relationship is high, resulting in deviations of the model. Therefore, the relationship between the independent variables needs to be checked in order to ensure that there is no relationship by indicating the statistical hypothesis H_0 : the two variables have no relationship; and H_1 : the two variables have a relationship.

Upon testing the relationship between the independent variables by the using pair-wise correlation matrix from Table 7.5, the study finds a fairly high relationship between the independent variables, such as the POP variable and the credit variable, the POP variable and the ESTB variable, and the credit variable and the No_TOURISM variable, which leads to a multicollinearity problem, resulting in the impossibility of identifying which independent variable affects the dependent variable. In order to solve the above problem, the model was transformed through taking logarithms of both sides before retesting the relationship. Further, the study finds that the relationships between some of the variables was high, such as $\log(\text{POP})$ and $\log(\text{PY})$, $\log(\text{Credit})$ and $\log(\text{ELECT_SOLD})$, as detailed in Table 7.6. In order to further solve the multicollinearity problem, the model was transformed by using a differencing method and the pair-wise correlation matrix. This time a relationship between the independent variables is not present, as shown in Table 7.7.

The above performance affects the skewness and kurtosis of the variables to be closer to the normal distribution and the statistical estimation was more reliable. The details are shown in Figure 7.10.

log (RealGPPPC)**log (FD)****log (FDG)****log (POP)**

log (Credit)**log (PY)****log (ESTB)****log (ELEC_SOLD)****log (No_TOURISM)****EFF**

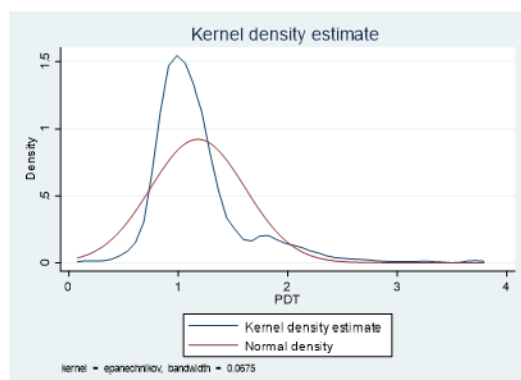
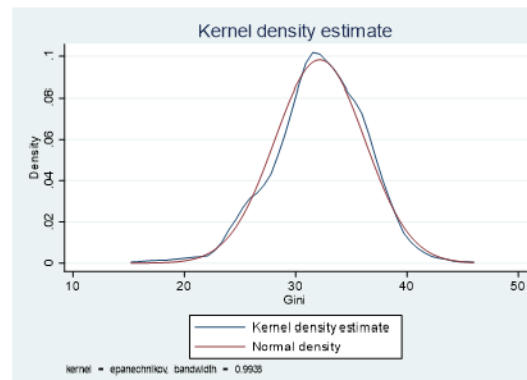
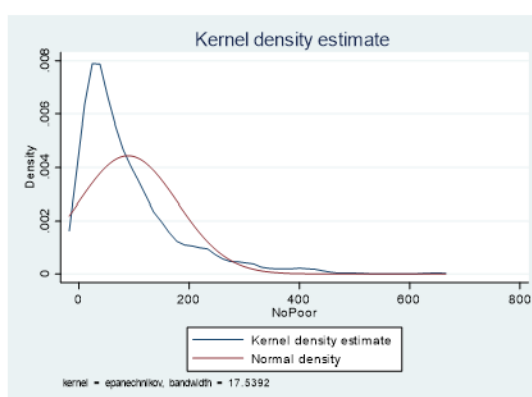
PDT**Gini****No_Poor**

Figure 7.10 Distribution of Variables

Table 7.5 Pair-Wise Correlation Matrix

Variables	FD	FDG	POP	PY	CREDIT	ESTB	ELECT_SOLD	No_TOURISM
FD	1.0000	-	-	-	-	-	-	-
FDG	-0.5314	1.0000	-	-	-	-	-	-
POP	0.3149	-0.3855	1.0000	-	-	-	-	-
PY	0.6388	-0.3750	0.4428	1.0000	-	-	-	-
CREDIT	0.2895	-0.3368	0.9020	0.4658	1.0000	-	-	-
ESTB	0.4019	-0.4217	0.9379	0.5187	0.9757	1.0000	-	-
ELECT_SOLD	0.5634	-0.5406	0.8915	0.5903	0.8800	0.9358	1.0000	-
No_TOURISM	0.4599	-0.3755	0.8809	0.5214	0.9353	0.9365	0.8918	1.0000

Table 7.6 Pair-Wise Correlation Matrix with Take Log

Variables	log (FD)	log (FDG)	log (POP)	log (PY)	log (CREDIT)	log (ESTB)	log (ELECT_SOLD)	log (No_TOURISM)
log (FD)	1.0000	-	-	-	-	-	-	-
log (FDG)	-0.5391	1.0000	-	-	-	-	-	-
log (POP)	0.2593	-0.3746	1.0000	-	-	-	-	-
log (PY)	0.6608	-0.3353	0.2302	1.0000	-	-	-	-
log (CREDIT)	0.6159	-0.4743	0.8567	0.5350	1.0000	-	-	-
log (ESTB)	0.6736	-0.5770	0.8303	0.5028	0.9467	1.0000	-	-
log (ELECT_SOLD)	0.7432	-0.5840	0.7352	0.5949	0.8884	0.9109	1.0000	-
log (No_TOURISM)	0.6454	-0.3424	0.5523	0.4792	0.7548	0.7354	0.7262	1.0000

Table 7.7 Pair-Wise Correlation Matrix with Differencing

Variables	dlog (FD)	dlog (FDG)	dlog (POP)	dlog (PY)	dlog (CREDIT)	dlog (ESTB)	dlog (ELECT_SOLD)	dlog (No_TOURISM)
dlog (FD)	1.0000	-	-	-	-	-	-	-
dlog (FDG)	0.1132	1.0000	-	-	-	-	-	-
dlog (POP)	-0.0211	-0.0623	1.0000	-	-	-	-	-
dlog (PY)	-0.0557	0.1177	-0.0197	1.0000	-	-	-	-
dlog (CREDIT)	-0.0900	0.2111	-0.20439	0.2320	1.0000	-	-	-
dlog (ESTB)	-0.0564	0.0254	0.0957	0.0136	-0.0486	1.0000	-	-
dlog (ELECT_SOLD)	0.0202	0.1028	0.2010	0.0193	0.1096	0.0408	1.0000	-
dlog (No_TOURISM)	-0.1082	0.0319	0.0028	0.1792	0.1056	0.0054	0.1098	1.0000

7.3.4 Heteroscedasticity Test

Heteroscedasticity is a problem related to errors (Error/Residual: ε), where the variance of the error obtained from the estimating equation is not constant [$E(\varepsilon_i^2) \neq \sigma$] and is different from the basic hypothesis of ordinary least squares (OLS), which indicates that the variance of the error must be constant [$E(\varepsilon_i^2) = \sigma$]. Normally, the use of cross-sectional data has the risk of higher heteroscedasticity than the use of time series data since the observation value of the cross-sectional data is different according to size or order, whereas the time series data have a slight difference in such matters. Heteroscedasticity causes the regression coefficient to remain unbiased and consistent while losing efficiency. Moreover, the use of OLS in estimating the regression coefficient and solving the heteroscedasticity problem makes the standard error of estimation of the regression coefficient different from reality, causing unreliability in the hypothesis testing. Upon testing the heteroscedasticity problem using Breusch-Pagan Lagrange multiplier indicating H_0 : No cross-section dependence (correlation) in residuals, $\text{prob} < 0.05$ is present, therefore H_0 is rejected. It was concluded that there was no heteroscedasticity problem.

7.3.5 Autocorrelation Test

Autocorrelation is a problem related to errors (Error/Residual: ε) similar to the heteroscedasticity problem. However, the autocorrelation problem occurs when the errors have a relationship or the errors have dependent distribution [$\text{Cov}(\varepsilon_i, \varepsilon_j) = E(\varepsilon_i, \varepsilon_j) \neq 0$ for all $i \neq j$], which is different from the basic hypothesis of ordinary least squares with the basic hypothesis that the error must have a correlation [$\text{Cov}(\varepsilon_i, \varepsilon_j) = E(\varepsilon_i, \varepsilon_j) = 0$ for all $i \neq j$]. The relationship between errors may be a positive autocorrelation or a negative autocorrelation. Generally, a correlation between errors occurs in the form of a serial correlation or spatial correlation in some cases.

The autocorrelation problem causes the regression coefficient to remain unbiased and consistent while losing efficiency and makes the use of OLS in estimating the regression coefficient lack the best linear unbiased estimator (BLUE), resulting in the forecast of the regression equation obtained from the regression equation with autocorrelation problems with more errors in the forecast than the

regression equation without an autocorrelation problem. In addition, the error of the estimating coefficient may be underestimated, which results in a higher t-statistic value than it actually is, leading to an incorrect conclusion.

The Durbin-Watson statistics were used to test the autocorrelation problem in this study. The hypotheses to be tested were as follows:

$H_0: \rho = 0$ (non-autocorrelation)

$H_1: \rho \neq 0$ (autocorrelation)

Based on the above hypothesis, the Durbin-Watson statistics were used for testing which could be calculated from the following formula:

$$D.W. = \frac{\sum_{t=2}^T (\varepsilon_t - \varepsilon_{t-1})^2}{\sum_{t=1}^T \varepsilon_t^2}$$

Where ε is the error of the regression equation estimated using OLS

$$D.W. = 2 (1 - \rho)$$

Where ρ is the coefficient of error in the regression equation which shows the relationship between the error term across time

$$[\varepsilon_t = \rho \varepsilon_{t-1} + u_t] \text{ or } \rho = \frac{\sum_{t=2}^T \varepsilon_t \varepsilon_{t-1}}{\sum_{t=1}^T \varepsilon_t^2}$$

From the above formula, the Durbin-Watson statistic was found to be 2.03, which was close to 2, indicating that there was no autocorrelation problem.

7.3.6 Unit Root Test

In estimating the coefficient of the model, a test had to be conducted to see whether such data had stationary properties. This is because if the non-stationary data are tested, even though the results suggest a relationship between the independent and

dependent variable and the R^2 is high, it may be just a spurious relationship. In testing whether the data are stationary, a unit root test can be conducted. In this research the Augmented Dickey-Fuller (ADF) test was used for testing by determining H_0 : non-stationary and H_1 : stationary. The results of the stationary testing using the unit root test of each variable suggested that $\text{prob} < 0.05$; therefore, H_0 was rejected. The variables were stationary.

7.4 Results of the Relationship Testing with Economic Growth

This research conducted the testing by using pooling of cross-sectional and time-series data or panel data and considered the suitability of the model by using the Lagrange multiplier test and the Hausman test in order to comparatively test the suitability between the pooled ordinary least squares model, the fixed effect model, and the random effect model.

$$\begin{aligned} d \log (\text{realGPPPC}_{it}) = & \alpha + \beta_1 d \log (\text{FD}_{it}) + \beta_2 d \log (\text{FDG}_{it}) + \beta_3 d \log (\text{PY}_{it}) + \beta_4 d \log \\ & (\text{Credit}_{it}) + \beta_5 d \log (\text{ESTB}_{it}) + \beta_6 d \log (\text{ELECT_SOLD}_{it}) + \beta_7 d \log \\ & (\text{No_TOURISM}_{it}) + \beta_8 d \log (\text{POP}_{it}) + \beta_9 \text{EFF}_{it} + \beta_{10} \text{PDT}_{it} + \varepsilon_{it} \end{aligned}$$

Where

realGPPPC_{it} = real gross provincial product per capita of i province as of year t

FD_{it} = fiscal decentralization, excluding grants (taking account of the locally levied revenue by the local government organization in comparison with the total revenue) of i Province as of year t

FDG_{it} = fiscal decentralization, including grants (taking account of the locally levied revenue and grants by the local government organization in comparison with the total revenue) of i province as of year t

PY_{it} = monthly household income per capita of i province as of year t

Credit_{it} = amount of credits of commercial banks of i province as of year t

ESTB_{it} = number of business establishments of i province as of year t

$ELECT_SOLD_{it}$ = amount of electricity distribution of i province as of year t

$No_TOURISM_{it}$ = number of tourists of i province as of year t

POP_{it} = size of the population of i province as of year t

EFF_{it} = technical efficiency of local government organization of i province as of year t

PDT_{it} = productivity of local government organization of i province as of year t

ε_{it} = error term

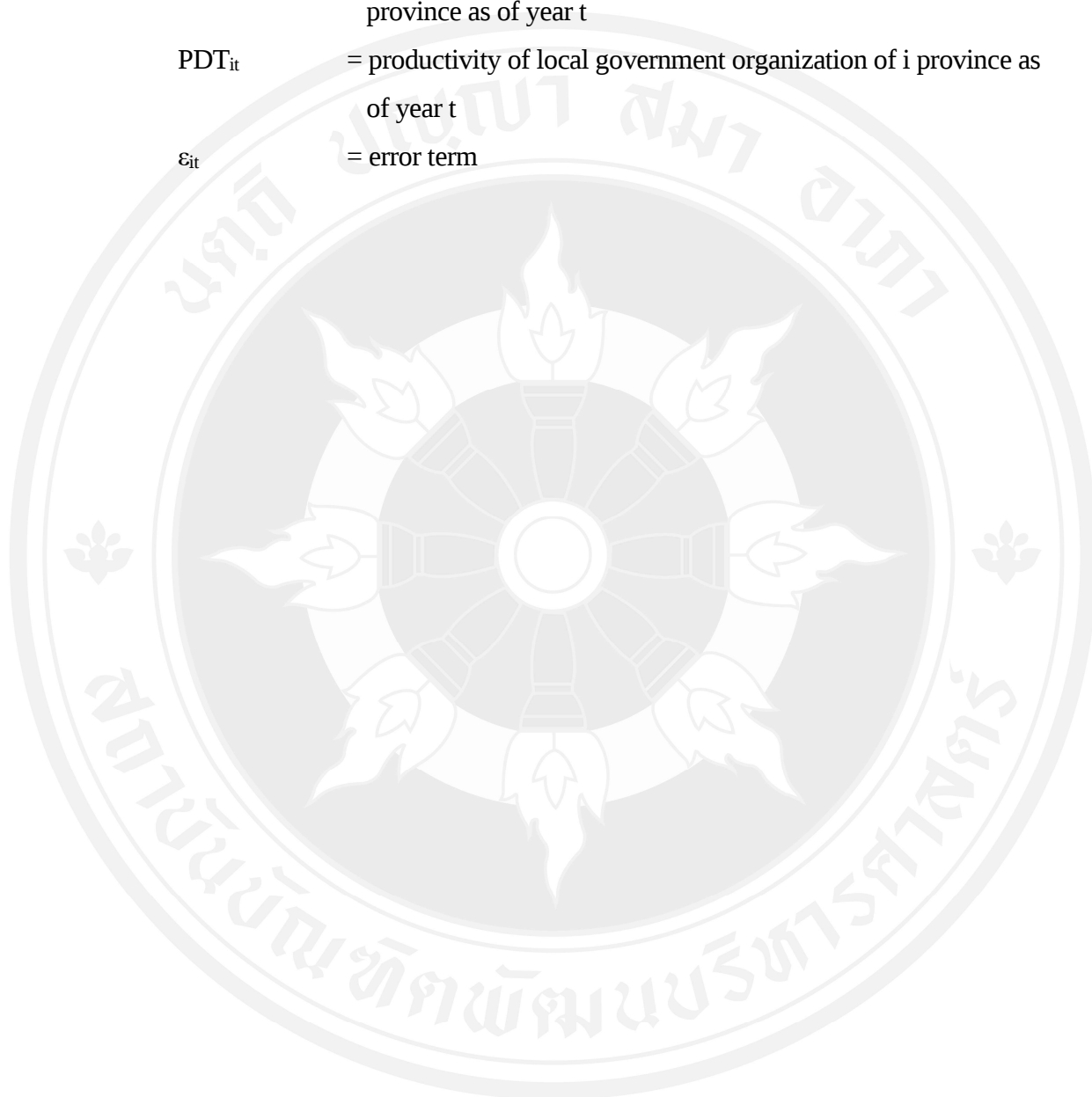


Table 7.8 Results of the Study Using the Pooled OLS Model with Economic Growth

Dependent Variable: dlogrealGPPPC										
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	0.0099 (0.000)	0.0091 (0.000)	0.0096 (0.000)	0.0085 (0.000)	0.0087 (0.000)	0.0087 (0.000)	0.0036 (0.026)	0.0018 (0.298)	0.0080 (0.118)	0.0850 (0.000)
dlog(FD)	-0.0028 (0.855)	-0.0083 (0.594)	-0.0094 (0.539)	-0.0058 (0.699)	-0.0061 (0.687)	-0.0059 (0.700)	-0.0082 (0.576)	-0.0041 (0.778)	-0.0023 (0.875)	-0.0077 (0.598)
dlog(FDG)	-	0.0953** (0.002)	0.0863** (0.004)	0.0739** (0.014)	0.0750** (0.015)	0.0746** (0.016)	0.0573** (0.055)	0.0571* (0.054)	0.0551* (0.063)	0.0310 (0.299)
dlog(POP)	-	-	-0.4695** (0.000)	-0.4652** (0.000)	-0.4657** (0.000)	-0.4680** (0.000)	-0.5939** (0.000)	-0.5899** (0.000)	-0.5819** (0.000)	-0.5837** (0.000)
dlog(PY)	-	-	-	0.0971** (0.001)	0.0981** (0.001)	0.0980** (0.001)	0.0100** (0.001)	0.0870** (0.003)	0.0892** (0.002)	0.0890** (0.002)
dlog(Credit)	-	-	-	-	-0.0051 (0.863)	-0.0046 (0.876)	-0.0237 (0.413)	-0.0273 (0.342)	-0.0263 (0.360)	-0.0494* (0.088)
dlog(ESTB)	-	-	-	-	-	0.0048 (0.801)	0.0018 (0.923)	0.0019 (0.916)	0.0013 (0.944)	0.0061 (0.737)
dlog(ELECT_SOLD)	-	-	-	-	-	-	0.3276** (0.000)	0.3124** (0.000)	0.3208** (0.000)	0.2840** (0.000)
dlog(No_TOURISM)	-	-	-	-	-	-	-	0.0562** (0.005)	0.0571** (0.004)	0.0412** (0.015)

Dependent Variable: dlogrealGPPPC										
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
EFF	-	-	-	-	-	-	-	-	0.0331*	0.0741**
PDT	-	-	-	-	-	-	-	-	(0.097)	(0.001)
	-	-	-	-	-	-	-	-	-	0.0118**
	-	-	-	-	-	-	-	-	-	(0.000)
R ²	0.001	0.0179	0.0614	0.0806	0.0806	0.0807	0.1477	0.1605	0.1632	0.1889
Obs	532	532	532	532	532	532	532	532	532	532
No of province	76	76	76	76	76	76	76	76	76	76
Prob(F-statistic)	0.0001	0.0084	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: t-statistic is the number in parentheses ** significant at a 95% confidence level * significant at a 90% confidence level

Table 7.9 Results of the Study Using the Fixed Effect Model with Economic Growth

Dependent Variable: dlogrealGPPPC										
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	0.0099 (0.000)	0.0091 (0.000)	0.0095 (0.000)	0.0085 (0.000)	0.0092 (0.000)	0.0092 (0.000)	0.0045 (0.009)	0.0029 (0.112)	-0.0273 (0.198)	-0.0864 (0.001)
dlog(FD)	-0.0088 (0.577)	-0.0143 (0.365)	-0.0147 (0.342)	-0.0109 (0.477)	-0.0121 (0.434)	-0.0121 (0.435)	-0.0137 (0.365)	-0.0097 (0.519)	-0.0085 (0.595)	-0.0139 (0.352)
dlog(FDG)	-	0.0946** (0.003)	0.0881** (0.004)	0.0743** (0.016)	0.0787** (0.013)	0.0788** (0.013)	0.0658** (0.033)	0.0656** (0.032)	0.0635** (0.038)	0.0357 (0.245)
dlog(POP)	-	-	-0.4542** (0.000)	-0.4512** (0.000)	-0.4540** (0.000)	-0.4539** (0.000)	-0.5875** (0.000)	-0.5725** (0.000)	-0.5632** (0.000)	-0.5866** (0.000)
dlog(PY)	-	-	-	0.1010** (0.001)	0.1060** (0.001)	0.1060** (0.001)	0.1061** (0.001)	0.0945** (0.003)	0.0971** (0.002)	0.0999** (0.001)
dlog(Credit)	-	-	-	-	-0.0219 (0.487)	-0.0219 (0.488)	-0.0339 (0.886)	-0.0392 (0.202)	-0.0382 (0.213)	-0.0670** (0.030)
dlog(ESTB)	-	-	-	-	-	-0.0002 (0.991)	0.0027 (0.886)	-0.0025 (0.894)	-0.0031 (0.870)	0.0026 (0.887)
dlog(ELECT_SOLD)	-	-	-	-	-	-	0.2900** (0.000)	0.2728** (0.000)	0.2821** (0.000)	0.2356** (0.000)
dlog(No_TOURISM)	-	-	-	-	-	-	-	0.0532** (0.015)	0.0541** (0.013)	0.0429** (0.046)

Dependent Variable: dlogrealGPPPC										
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
EFF	-	-	-	-	-	-	-	-	0.0299	0.0753**
	-	-	-	-	-	-	-	-	(0.153)	(0.001)
PDT	-	-	-	-	-	-	-	-	-	0.0132**
	-	-	-	-	-	-	-	-	-	(0.007)
R ²	0.0001	0.0176	0.0611	0.0803	0.0798	0.0798	0.1463	0.1590	0.1634	0.1862
Obs	532	532	532	532	532	532	532	532	532	532
No of province	76	76	76	76	76	76	76	76	76	76
Prob (F-statistic)	0.5788	0.0093	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: t-statistic is the number in parentheses ** significant at a 95% confidence level * significant at a 90% confidence level

Table 7.10 Results of the Study Using the Random Effect Model with Economic Growth

Dependent Variable: dlogrealGPPPC										
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	0.0099 (0.000)	0.0091 (0.000)	0.0096 (0.000)	0.0086 (0.000)	0.0087 (0.000)	0.0087 (0.000)	0.0036 (0.026)	0.0018 (0.297)	-0.0315 (0.117)	-0.0850 (0.000)
dlog(FD)	-0.0028 (0.855)	-0.0083 (0.594)	-0.0094 (0.538)	-0.0059 (0.699)	-0.0061 (0.687)	-0.0059 (0.700)	-0.0082 (0.576)	-0.0041 (0.778)	-0.0023 (0.875)	-0.0077 (0.598)
dlog(FDG)	-	0.0953** (0.002)	0.0863** (0.004)	0.0740** (0.014)	0.0750** (0.015)	0.0746** (0.015)	0.0573* (0.055)	0.0571* (0.054)	0.0551* (0.063)	0.0360 (0.298)
dlog(POP)	-	-	-0.4695** (0.000)	-0.4652** (0.000)	-0.4658** (0.000)	-0.4680** (0.000)	-0.5939** (0.000)	-0.5899** (0.000)	-0.5819** (0.000)	-0.5837** (0.000)
dlog(PY)	-	-	-	0.0971** (0.001)	0.0982** (0.001)	0.0980** (0.001)	0.1000** (0.001)	0.0870** (0.003)	0.0892** (0.002)	0.0890** (0.002)
dlog(Credit)	-	-	-	-	-0.0051 (0.863)	-0.0047 (0.876)	-0.0237 (0.412)	-0.0273 (0.341)	-0.0263 (0.360)	-0.0495* (0.087)
dlog(ESTB)	-	-	-	-	-	0.0048 (0.801)	0.0018 (0.923)	0.0019 (0.916)	0.0013 (0.944)	0.0061 (0.737)
dlog(ELECT_SOLD)	-	-	-	-	-	-	0.3276** (0.000)	0.3124** (0.000)	0.3208** (0.000)	0.2840** (0.000)
dlog(No_TOURISM)	-	-	-	-	-	-	-	0.0562** (0.005)	0.0572** (0.004)	0.0482** (0.015)

Dependent Variable: dlogrealGPPPC										
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
EFF	-	-	-	-	-	-	-	-	0.0331* (0.096)	0.0742** (0.001)
PDT	-	-	-	-	-	-	-	-	-	0.0118** (0.000)
R ²	0.0001	0.0179	0.0614	0.0806	0.0806	0.0807	0.1477	0.1605	0.1649	0.1889
Obs	532	532	532	532	532	532	532	532	532	532
No of province	76	76	76	76	76	76	76	76	76	76
Prob (F-statistic)	0.8554	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: t-statistic is the number in parentheses ** significant at a 95% confidence level * significant at a 90% confidence level

Based on the estimation by using the Lagrange multiplier to test the suitability between the pooled OLS model and the random effect model with H_0 : no effect and H_1 : random effect, the results suggested that $\text{prob} < 0.05$, and therefore H_0 was rejected. It can be concluded that the random effect model should be used in comparison with the pooled OLS model with the level of significance at 95 percent. After that, the suitability of the fixed effect model and random effect model was examined by using the Hausman test where H_0 : fixed effect model = random effect model and H_1 : random effect model. The results suggested that $\text{prob} < 0.05$, and therefore H_0 was rejected. It can be concluded that the fixed effect model was more suitable than the random effect model.

According to Table 7.9, when considering the coefficient of each independent variable, the following relationships were found:

1) Fiscal Decentralization, Excluding Grants (FD)

The coefficient of the change of fiscal decentralization, excluding grants ($\text{dlog}(\text{FD})$) has the opposite direction of relationship from the change of real gross provincial product per capita ($\text{dlog}(\text{realGPPPC})$). However, such a relationship was not significant at the statistical level of 95%. The results of the study are consistent with the findings of Baskaran and Feld (2013), Ligthart and Van Oudheusden (2017) and Adefeso (2014). Mostly, when the local government organization collects a lot of taxes, the local government organization executives may spend this revenue on local development and economic growth. However, the law indicates that the local government organization can collect its own revenue from property and land tax, local maintenance tax, signboard tax, and animal killing duty while the central government determines the types and rates of taxes for the local government organization (one size fits all). The local government organization does not have any power to select the types or rates of taxes that are suitable for the environment of each locality, making some local government organizations generate more revenue from taxation but others may not gain any. In addition, there are many limitations regarding Thai local government. For instance, property and land taxes are not adjusted to serve the real circumstances of some areas, or some local government organizations impose a waste collection fee, but it does not cover the actual operational cost. Some local government organizations may try to collect full taxes, but the condition of the area condition does not allow them to have appropriate

sources of revenue, so they need to rely on grants. More importantly, local government organizations have no freedom to determine their own financial policies to foster local economic development. For example, if they want to promote economic growth in their communities, the executives cannot adjust the tax rates in favor of economic growth, as they are required to spend the budget as determined by the law, failing which they will be deemed to be violating their obligations. This results in a positive relationship with economic growth without a statistical significance.

2) Fiscal Decentralization, Including Grants (FDG)

The coefficient of the change of fiscal decentralization, including grants ($\text{dlog}(\text{FDG})$), has the same direction of relationship as the change of real gross provincial product per capita ($\text{dlog}(\text{realGPPPC})$). However, such a relationship was not significant at the statistical level of 95 percent. The grants are an important source of revenue for the local government, accounting for 40 percent of the total revenue. Most of the grants provided are general grants, which account for 80 percent of all grants. Recently, the government tends to allocate more general grants to the local government, which is likely to affect the economic expansion. However, the criteria for grant allocation were found to focus more on equity and income distribution rather than economic expansion. For example, the grants are allocated to the local government using the inverse method based on the proportion of revenue, excluding grants, or the proportion of special grants. Sometimes the grants are allocated based on the number of population or the area size. These criteria may cause the allocation of grants to the local government have no effect on economic expansion.

3) Size of the Population (POP)

The coefficient of the change of the size of the population ($\text{dlog}(\text{POP})$) has the opposing direction of relationship as the change of actual gross provincial product per capita ($\text{dlog}(\text{realGPPPC})$) at a statistical significance level of 95 percent. The results of the study are consistent with the findings of Woller and Phillips (1998). This was probably because of the decreasing productivity of the Thai population, as well as the lack of skilled labor. Jitsuchon (2012), Chareongwongsak (2015), and Wongsindhuwiseth and Charunpipatkul (2017) indicated that Thailand has faced the problem of the quality of human resources. In order to upgrade economic development, it is necessary to enhance the quality of human resources in order to

increase competitiveness in the changing environment so as to release Thailand from the middle-income trap.

4) Monthly Household Income Per Capita (PY)

The coefficient of the change of monthly household income per capita ($\text{dlog}(\text{PY})$) has the same direction of relationship as the change of real gross provincial product per capita ($\text{dlog}(\text{realGPPPC})$) at a statistical significance level of 95 percent, which coincides with the economic theory that, when people have a higher income, spending will also increase, contributing to an increase in gross provincial product per capita. The results of study are consistent with Rodriquez-Pose and Kroijer (2009).

5) Amount of Credits of Commercial Banks (Credit)

The coefficient of the change of the amount of credits of commercial banks ($\text{dlog}(\text{Credit})$) has the opposing direction of relationship as the change of real gross provincial product per capita ($\text{dlog}(\text{realGPPPC})$) at a statistical significance level of 95 percent. The amount of credit release of commercial banks that has been determined as the representative of the capital product in the tested model may not affect the creation of the gross provincial product per capita in the relevant year. However, it would have impacts after a certain period of time as the private sector would spend the credits through consumption and investment, and after that, it would affect the gross provincial product per capita. Furthermore, another possible cause is that the productivity of the capital product has decreased as Thailand lacks scientific and technological innovation to support competitiveness, which is in consistent with the lack of the productivity of labor.

6) Number of Business Establishments (ESTB)

The coefficient of the change of the number of business establishments ($\text{dlog}(\text{ESTB})$) has the same direction of relationship as the change of the real gross provincial product per capita ($\text{dlog}(\text{realGPPPC})$) without a statistical significance level of 95%. This was probably because the number of business establishments did not indicate the size, production capacity, or potentials of the business establishments. Therefore, despite the equal number of business establishments, the effects on the economy may be different.

7) Number of Tourists (No_TOURISM)

The coefficient of the change of number of tourists ($\text{dlog}(\text{No_TOURISM})$) has a positive relationship as the change of real gross provincial product per capita ($\text{dlog}(\text{realGPPPC})$) with a statistical significance level of 95%. This was because the tourists that visit the provinces will spend their money on accommodations and travel fees, and these expenses are significant factors in fostering the economy in the provinces. Therefore, many provinces have tried to stimulate tourism to develop the economy in the provinces.

8) Amount of Electricity Distribution (ELECT_SOLD)

The coefficient of the change of the amount of electricity distribution ($\text{dlog}(\text{ELECT_SOLD})$) has a positive relationship as the change of real gross provincial product per capita ($\text{dlog}(\text{realGPPPC})$) with a statistical significance level of 95 percent. This was because 70 percent of the amount of electricity distribution consisted of 10 percent of small businesses, 15 percent of medium businesses, and 45 percent of large businesses. The remaining was residential housing. Thus, an increase in electricity distribution reflects that the business operators had more production and provided more services, contributing to economic growth.

9) Performance of the Local Government Organization (EFF, PDT)

The coefficient of the change of the performance of the local government organization, comprising efficiency (EFF) and productivity (PDT), has the same direction of relationship as the change of real gross provincial product per capita ($\text{dlog}(\text{realGPPPC})$) with a statistical significance level of 95 percent. This was because when the fiscal power has been decentralized to the local government, elected local administrators must implement fiscal policies to meet the needs of local people, resulting in the improvements of public service efficiency and productivity. If there is no improvement, it will definitely affect the next election.

Table 7.11 Summary of the Relationship of Variables

Independent Variables	Relationship with Economic Growth
Fiscal decentralization, excluding grants (FD)	Negative relationship with no statistical significance
Fiscal decentralization, including grants (FDG)	Positive relationship with no statistical significance
Monthly household income per capita (PY)	Positive relationship with a statistical significance
Amount of credits of commercial banks (Credit)	Negative relationship with a statistical significance
Number of business establishments (ESTB)	Positive relationship with no statistical significance
Amount of electricity distribution (ELECT_SOLD)	Positive relationship with a statistical significance
Number of tourists (No_TOURISM)	Positive relationship with a statistical significance
Size of the population (POP)	Negative relationship with a statistical significance
Efficiency of local government organization (EFF)	Positive relationship with a statistical significance
Productivity of local government organization (PDT)	Positive relationship with a statistical significance

7.5 Results of the Relationship Testing with Inclusive Growth

The relationships between intensive growth (IG) and the independent variables were tested. IG variables were divided into 1) realGPPPC compared to Gini coefficient (IG1), and 2) realGPPPC compared to the number of poor people (IG2). In terms of IG1, if the coefficients of the independent variables are positive, it means that those variables contribute to a poorer income distribution or increased inequality, resulting in decreased inclusive growth. On the other hand, if the coefficients of the independent variables are negative, it indicates that those variables contribute to a better income distribution or decreased inequality, leading to increased inclusive growth. As for IG2, if the coefficients of the independent variables are positive, it means that those variables contribute to an increase in the number of poor people, resulting in decreased inclusive growth. On the contrary, if the coefficients of the independent variables are negative, it shows that those variables contribute to decreased number of poor people, leading to increased inclusive growth.

The model used to examine the relationships is as follows:

$$\begin{aligned} IG_{it} = & \alpha + \beta_1 \ln(FD_{it}) + \beta_2 \ln(FDG_{it}) + \beta_3 \ln(PY_{it}) \\ & + \beta_4 \ln(Credit_{it}) + \beta_5 \ln(ESTB_{it}) + \beta_6 \ln(ELECT_SOLD_{it}) \\ & + \beta_7 \ln(No_TOURISM_{it}) + \beta_8 EFF_{it} + \beta_9 PDT_{it} + \varepsilon_{it} \end{aligned}$$

Where

IG_{it}	= inclusive growth of i province as of year t
FD_{it}	= fiscal decentralization, excluding grants (taking account of the locally levied revenue by the local government organization in comparison with the total revenue) of i province as of year t.
FDG_{it}	= fiscal decentralization, including grants (taking account of the locally levied revenue and grants by the local government organization in comparison with the total revenue) of i province as of year t.
PY_{it}	= monthly household income per capita of i province as of year t.
$Credit_{it}$	= amount of credits of commercial banks of i province as of year t.
$ESTB_{it}$	= number of business establishments of i province as of year t.
$ELECT_SOLD_{it}$	= amount of electricity distribution of i province as of year t.
$No_TOURISM_{it}$	= number of tourists of i province as of year t.
EFF_{it}	= technical efficiency of local government organization of i province as of year t.
PDT_{it}	= productivity of local government organization of i province as of year t.
ε_{it}	= error term

The suitability of the pooled OLS model, fixed effect model, and random effect model was examined using the Lagrange multiple method and Hausman test, the results indicated that the pooled OLS model is suitable. The results of the relationship testing (IG1 and IG2) are detailed in Table 7.9 and 7.10.

Dependent Variable: d(realGPPPC) compared to d(Gini) (IG1)										
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	-	-	-	-	-	-	-	-	(0.458)	(0.322)
PDT	-	-	-	-	-	-	-	-	-	-3.6808
	-	-	-	-	-	-	-	-	-	(0.473)
R ²	0.0000	0.0024	0.0029	0.0034	0.0048	0.0049	0.0049	0.0049	0.0061	0.0073
Obs	456	456	456	456	456	456	456	456	456	456
No of province	76	76	76	76	76	76	76	76	76	76
Prob (F-statistic)	0.9612	0.5815	0.7304	0.8233	0.8268	0.9003	0.9473	0.9738	0.9729	0.9740

Note: t-statistic is the number in parentheses ** significant at a 95% confidence level * significant at a 90% confidence level

Table 7.13 Results of the Study Using the Pooled OLS Model with Inclusive Growth (IG2)

Dependent Variable: d(realGPPPC) compared to the number of poor people d(No_Poor) (IG2)										
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	-2.7181 (0.001)	-2.7322 (0.001)	-2.9603 (0.001)	-2.3461 (0.009)	-2.5499 (0.019)	-2.5877 (0.018)	-3.4193 (0.011)	-3.4740 (0.018)	15.5447 (0.350)	6.7045 (0.738)
dlog(FD)	24.1629** (0.026)	25.4815** (0.027)	25.5633** (0.027)	24.3055** (0.034)	24.5202** (0.033)	24.8068** (0.032)	26.2913** (0.024)	26.4629** (0.025)	26.9055** (0.022)	26.3143** (0.026)
dlog(FDG)	-	-10.3636 (0.731)	-10.3812 (0.730)	-6.9338 (0.817)	-7.7083 (0.797)	-8.3469 (0.782)	-19.0116 (0.549)	-19.4005 (0.545)	-26.0473 (0.424)	-30.6839 (0.354)
dlog(POP)	-	-	194.346 (0.456)	219.9472 (0.395)	216.8124 (0.403)	213.0749 (0.412)	246.1856 (0.347)	244.9044 (0.350)	259.9024 (0.322)	244.5088 (0.353)
dlog(PY)	-	-	-	-64.5658** (0.003)	-66.1759** (0.003)	-66.3664** (0.003)	-65.9339** (0.003)	-66.2912** (0.004)	-67.3323** (0.003)	-67.2637** (0.003)
dlog(Credit)	-	-	-	-	7.2784 (0.736)	7.7354 (0.712)	3.2548 (0.883)	3.0900 (0.889)	0.6290 (0.977)	-3.1135 (0.891)
dlog(ESTB)	-	-	-	-	-	4.4752 (0.739)	4.2057 (0.754)	4.2199 (0.753)	4.7409 (0.724)	5.4584 (0.685)
dlog(ELECT_SOLD)	-	-	-	-	-	-	45.4515 (0.288)	45.2214 (0.292)	46.3514 (0.280)	40.2718 (0.355)
dlog(No_TOURISM)	-	-	-	-	-	-	-	1.5959 (0.928)	1.1967 (0.946)	-0.9846 (0.956)

Dependent Variable: d(realGPPPC) compared to the number of poor people d(No_Poor) (IG2)										
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
EFF	-	-	-	-	-	-	-	-	-19.0304	-12.0964
PDT	-	-	-	-	-	-	-	-	(0.251)	(0.519)
	-	-	-	-	-	-	-	-	-	1.8528
	-	-	-	-	-	-	-	-	-	(0.430)
R ²	0.0108	0.0111	0.0123	0.0312	0.0315	0.0317	0.0342	0.0342	0.0370	0.0384
Obs	456	456	456	456	456	456	456	456	456	456
No of province	76	76	76	76	76	76	76	76	76	76
Prob (F-statistic)	0.0264	0.0802	0.1330	0.0063	0.0130	0.0241	0.0284	0.0476	0.0492	0.0625

Note: t-statistic is the number in parentheses ** significant at a 95% confidence level * significant at a 90% confidence level

Based on the coefficients of the independent variables shown in Table 7.12 and 7.13, the relationships between the independent variables and inclusive growth can be summarized as follows:

1) The locally levied tax is not related to equity in income distribution but leads to an increase in the number of poor people.

Unequal income distribution is a deep-rooted problem in Thailand. Policymakers have tried to formulate social and economic policies to solve the problem through various projects. Although Thailand's economic development continues to expand, the problem of unequal income distribution poses a long-term risk to the country's economic stability. Fiscal decentralization, excluding grants (FD) has an effect on poorer income distribution with no statistical significance. When analyzed in detail, about half of locally levied revenue is house and land tax collected according to the 1932 House and Land Tax Act. This kind of tax is collected from properties that generate income, except for properties used as a primary residence and empty/unused properties. Therefore, property owners are able to shift taxes to tenants or consumers in form of higher rents or product and service charges. This situation confirms the testing results that fiscal decentralization, excluding grants (FD) does not contribute to better income distribution. As rich property owners can shift the tax burden to tenants that are mostly poor, the taxation is unfair and does not lead to better living conditions (Kerdthungyang, 2012).

In addition, a high tax rate of 12 percent is another factor motivating property owners to shift the tax burden to others. Once actual taxpayers are not those legally required to pay taxes, it is against the principle of certainty, which is one of the most important components of a good tax system and leads to inequity in taxation. A fixed tax rate of 12 percent of annual rental value that is applied to all kinds of properties is also not in line with the ability-to-pay principle, which states that those who have a greater ability to pay taxes should pay more. A fixed tax rate makes property owners with higher income from rental property pay taxes at the same rate as those with lower income, resulting in more unequal income distribution.

The local maintenance tax specified in the 1965 Local Maintenance Tax Act is collected by local government organizations. Section 7 states that property owners are required to pay local maintenance tax based on the specified tax rate.

However, the tax rate specified in this act is regressive rather than progressive. This is against the principle of tax equity, which emphasizes that people with different abilities should pay different taxes and those with greater abilities should pay more taxes. Moreover, local maintenance tax is collected based on the moderate price of land in 1978-1981, which is considered unfair because the development of transportation systems and utilities varies in each locality affecting changes in land value. In addition, as the act has been enforced for more than 40 years, the specified moderate price of land is lower than the market price, resulting in lower tax collection (Techarungnirun, 2009).

The results of the present study sit in line with (Singkaneti & Pumkaew, 2017), whose study suggests that the current revenue structure of local government organizations does not consider the differences in socio-economic structures of urban and rural areas. For example, the municipality and TAOs, which have different social and economic conditions, leading to different public service needs. However, this study finds that both organizations have the same income structure. Pattamasiriwat (2014) indicates that economic concentration in Thailand results in diverse local tax bases in Bangkok and vicinity, as well as the Eastern Region, Northeastern Region, and Northern Region, leading to higher spatial income inequality.

2) Grants can contribute to better income distribution and benefit poor people

The research results show that the fiscal decentralization, including grants (FDG) leads to more equity in income distribution and generates more benefits for the poor. Government grants provided to local government organizations are divided into general and specific grants. General grants are allocated based on the set criteria. One of the criteria is that the general grants must be allocated to a local government organization in proportion to its revenue excluding grants received through inverse allocation method and in proportion to the specific grants received through inverse allocation method. This contributes to a fair allocation of grants and makes the poor in small local government organizations receive more benefits. However, other unfair allocation criteria comprise the allocation of grants based on the population size and area size. Such criteria make small local government

organizations likely to receive less benefits than large local government organizations and generate lower benefit incidences for the poor. Thus, the results of the relationship testing show no significant relationship.

Specific grants are allocated to local government organizations in order to perform specific tasks determined by the central government. Therefore, local government organizations cannot exercise their discretion on any spending. The allocation of specific grants mostly depends on political negotiations between local government organizations and key budget decision-makers. Local government organizations that have political ties with politicians tend to receive specific grants (Pattamasiriwat & Pumkeaw, 2017).

In addition, specific grants are usually regarded as a budget provided to local representatives. Each representative tries to obtain specific grants by informally lobbying government agencies involved in budget allocation. If any representative is able to obtain specific grants for his/her election area, his/her popularity will increase. Moreover, specific grants can be distributed to canvassers, who are government contractors, in the form of construction work contracts such as road construction and canal dredging. This makes large local government organizations with dense populations have a higher tendency to receive specific grants, resulting in the unequal distribution of budgets.

3) Increased average income per capita does not improve equality but is a key factor in reducing the number of poor people.

Poor people are people whose income is insufficient for acquiring essential food and basic household items or whose income is below the poverty line. It is likely that an increase in average income per capita has no effect on income distribution because all groups of people, including the poor and the rich, equally benefit from such an income increase. However, an increase in average income per capita means some poor people will receive income above the poverty line. This is in line with research results which indicate that increased average income per capita does not affect income distribution but significantly contributes to poverty reduction. These results can be used as guidelines for reducing the number of poor people.

4) The volume of commercial bank credit is not related to income equality and the number of poor people.

The volume of commercial bank has no effect on income distribution and poverty reduction. This is because poor people often do not have access to formal financial services, mainly due to a lack of credibility to get loans from commercial banks, insufficient collateral, and limited availability of banks in rural areas. This is consistent with the study of Attaworadej et al. (2011), which suggests that poor people do not have access to financial services of financial institutions, so they have to borrow money from informal sources, leading to the problem of informal debt. Rich capitalists often take the opportunity to provide loans to people with a high interest rate of 15 to 20 percent per month. This makes debtors bear the high and unfair burden of debt repayment.

The government recognizes the importance of this issue and has developed policies to support and stimulate the local economy through various funding and credit assistance programs such as village funds, people's banks, and debt moratorium programs for small farmers. However, there are still problems in the implementation of government policies. Poor people often are cut off from access to formal loans due to lack of consistent cash flow and sufficient collateral. According to the study of Netayarak (2001), most poor people borrow money from informal sources for occupational and consumption purposes. They may borrow from relatives, neighbors, those with regular income, or informal loan lenders because the proportion of loans obtained from formal sources is limited and contains time-consuming processes. Poor people also generally have limited knowledge and experience in investing and in using money to improve their career or start a new job, and so a face high risk of defaulting.

Thailand Development Research Institution (TDRI) (2008) indicates that the government's funding and credit assistance programs have yet to reach the poor. Poor people are cut off from access to credit they need and lack cash flow for investment opportunities. There has been a lack of efficiency and clarity in the management of government programs. Some funding assistance may be available for those who are familiar with responsible officials, while highly vulnerable people are generally disqualified. Most of the beneficiaries are the non-poor rather than the poor. This kind of government assistance contributes to unequal income distribution and increases the gap between rich and poor.

5) Electricity distribution and the number of tourists is related to economic growth but has no effect on income distribution and poverty reduction.

Regarding the amount of electricity distribution, the data from the Metropolitan Electricity Authority and the Provincial Electricity Authority shown in Table 7.14 suggests that almost 100 percent of Thai households, regardless of income levels, both in municipal and non-municipal areas, have access to basic electricity services. Therefore, a higher volume of electricity sold does not reflect an increase in access to basic electricity services. In addition, Table 7.15 indicates that approximately 70 percent of the total electricity produced is sold to the small, medium, and large enterprises, while the rest is sold to the household sector. Thus, the increasing amount of electricity consumption mainly affects the expansion of industrial production. When testing the relationships between the amount of electricity distribution (ELECT_SOLD) and economic growth, there is a positive significant relationship between those two variables. However, that relationship does not affect income distribution and poverty reduction. This is because the poor who already have access to electricity services do not benefit from the increased consumption of electricity. Moreover, most of the poor in Thailand work in the agricultural sector and so they rarely benefit from industrial expansion, compared to other groups of people.

Table 7.14 Amount of Electricity Distribution

	2013		2017	
	Million kilowatt-hours	%	Million kilowatt-hours	%
Households	37,657.38	23.5%	44,725.45	24.7%
Small enterprises	18,374.15	11.4%	20,961.47	11.6%
Medium enterprises	27,219.15	17.0%	29,854.24	16.5%
Large enterprises	67,845.94	42.3%	75,072.27	41.4%
Total	160,556.77	100.0%	181,316.49	100.0%

Source: The Provincial Electricity Authority (2017); The Metropolitan Electricity Authority (2017)

Table 7.15 Percentage of Households with Access to Electricity Services Classified by Household Poverty

	Households with Access to Electricity in 2013 (%)			Households with Access to Electricity in 2017 (%)		
	Urban	Rural	Total	Urban	Rural	Total
Non-poor households	100	99.9	100	100	99.9	100
Poor households	99.3	98.0	98.4	99.6	99.0	99.2
Total	99.9	99.7	99.8	99.9	99.8	99.9

Source: The National Statistical Office (2017)

The information from the Office of the Permanent Secretary for Tourism and Sports presented in Table 7.16 indicates that foreign tourists travelling to Thailand spend most of their money on accommodation, followed by souvenirs and food and beverage. Thus, accommodation owners and tourism entrepreneurs are those who receive benefits from tourist spending, while poor people in the agricultural sector do not. This finding sits in line with the research results, showing that the number of tourists (No_TOURISM) does not affect income distribution and poverty alleviation.

Table 7.16 Average Spending of Foreign Tourists Travelling to Thailand Classified by Expenditure Types

	2013		2017	
	Baht/person/day	Percentage	Baht/person/day	Percentage
Accommodation	1,386.49	30.03%	1,555.60	28.79%
Food and beverage	879.84	19.06%	1,110.07	20.54%
Tourism services	184.67	4.00%	209.03	3.87%
Transportation	470.24	10.19%	529.61	9.80%
Souvenirs	1,093.27	23.68%	1,331.23	24.63%
Entertainment	540.54	11.71%	583.31	10.79%
Miscellaneous	61.44	1.33%	85.25	1.58%
Total	4,616.49	100%	5,404.10	100%

Source: Office of the Permanent Secretary for Tourism and Sports (2017).

6) Numbers of business establishments are not related to income distribution and poverty reduction.

The results of the relationship show that the number of business establishments (ESTB) does not affect income distribution and poverty reduction. According to data from the National Statistical Office, most of the poor rely on agriculture for their livelihoods. The rest of them work in household businesses without being paid. Therefore, the increased number of business establishments does not have a direct impact on income distribution and poverty alleviation. Although the increased number of business establishments is likely to lead to more employment opportunities, since most of the poor have lower levels of education, they have less opportunities to enter the formal employment system. Moreover, the number of business establishments does not indicate the employment volume and labor needs nor reflect the employment opportunities of the poor. Thus, it has no impact on income distribution.

7) The efficiency and productivity of local government organizations are not related to income distribution and the number of poor people.

Income distribution and poverty problems are complex structural problems, resulting from deprivation in many areas. These problems lead to a lack of life skills, education, resources, arable lands, political integration and participation, professional knowledge and information, self-reliance, and access to public services and assistance, which contributes to economic and social inequality. Local government organizations are a government actor working to solve such problems. However, due to limited duties and powers, local government organizations can only implement short-term solutions, while the root causes of the problems remain unsolved. This is consistent with present research results, which indicate that the efficiency (EFF) and productivity (PDT) of local government organizations does not affect income distribution and poverty reduction. Therefore, it is important for the government to accelerate solutions at the macro policy level in order to solve the problems such as providing the poor with access to basic services, professional knowledge, and opportunities out of poverty, increasing the yield per rai for poor people in the agricultural sector; enhancing educational opportunities and increasing welfare for poor households with high dependency rates.

Table 7.17 Summary of Relationship of Variables

Independent Variables	Relationship with Inclusive Growth	
	IG1	IG2
Fiscal decentralization, excluding grants (FD)	Positive relationship without statistical significance	Positive relationship with statistical significance
Fiscal decentralization, including grants (FDG)	Negative relationship without statistical significance	Negative relationship without statistical significance
Monthly household income per capita (PY)	Positive relationship without statistical significance	Negative relationship with statistical significance
Amount of credits of commercial banks (Credit)	Positive relationship without statistical significance	Negative relationship without statistical significance
Number of business establishments (ESTB)	Positive relationship without statistical significance	Positive relationship without statistical significance
Amount of electricity distribution (ELECT_SOLD)	Positive relationship without statistical significance	Positive relationship without statistical significance
Number of tourists (No_TOURISM)	Positive relationship without statistical significance	Negative relationship without statistical significance
Efficiency of local government organization (EFF)	Negative relationship without a statistical significance	Negative relationship without a statistical significance
Productivity of local government organization (PDT)	Negative relationship without a statistical significance	Positive relationship without a statistical significance

CHAPTER 8

CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

The aim of this dissertation is to test the relationship between fiscal decentralization, the performance of local government organizations and economic growth, including inclusive growth. The results, in accordance with the objectives of the study, are as follows:

The study finds that fiscal decentralization variable, excluding grants (FD), has a negative relationship with economic growth without a significance level of 95 percent. Generally, when local government organizations collect large amounts of taxes, local government organization executives spend revenue on local development and economic growth. However, local government organizations do not have any power to select the types or rates of taxes that are suitable for the environment of each locality. The types and rates of taxes collected are determined by the central government on a one size fits all basis, making some local government organizations generate more revenue from taxation than others. Some local government organizations try to collect full taxes but conditions do not allow this, meaning some organizations will rely on grants. Local government organizations often have no freedom to determine their own fiscal policies to foster local economic development. For example, if they want to promote economic growth in their communities, the tax rates in favor of economic growth cannot be adjusted as they are required to spend the budget as determined by law.

The study finds that the fiscal decentralization variable, including grants (FDG), has a positive relationship with economic growth, without a significance level of 95 percent. Since the criteria of grants to local government organizations considers the creation of equity and income distribution for local government organizations rather than on economic growth.

8.2 Suggestions

Fiscal decentralization is a key factor in terms of how power should be distributed so that local government organizations have independence and the appropriate capacity to engage in local autonomous decision-making. The key principle of fiscal decentralization in relation to local government organizations is that the duties of the central government and local government organizations should be clearly divided (expenditure assignment and revenue assignment) so that local government organizations are aware of their duties, which should be different from those of the central government. It also reflects the local government's independence in managing and administering local resources, as well as the power of revenue and expenditure management, in order to enhance the efficiency of public services.

Based on the conclusions of the previous chapter, the study finds that the fiscal decentralization, including grants (FDG), has a positive relationship with economic growth but without a statistical significance. While, fiscal decentralization, excluding grants (FD), also has a negative relationship without a statistical significance. These results stand in contrast with fiscal decentralization theory and economic growth, which normally suggest that actual fiscal decentralization stimulates economic growth, since local government organizations should be more aware of local peoples' needs than the central government. Economic theory suggests that the roles and responsibilities of local government organizations may be more beneficial for economic growth in terms of effective transfer of mission, budget and personnel. Moreover, fiscal decentralization allows people to take part in decision-making, which encourages effective spending that meets the actual needs of the local people. Additionally, people can closely monitor local government organization's executive performance. All of the above reasons support local economic growth.

However, the central government's duties are not only economic growth; other dimensions should also be considered, such as the maintenance of economic stability, income distribution and resource allocation. Furthermore, the basic principles that enable the financial self-reliance on local government organizations should be considered by supporting expenses according to the assigned missions so as to avoid making local government organizations rely only on the central government's budget

without any authority to regulate or take part in budget spending. For this reason, the results of this study lead to policy suggestions for the benefit of policymakers as follows:

- 1) Appropriate design of fiscal decentralization. In other words, the design of revenue generated to the Thai local government organization in the past can be seen from the fact that the proportion of the revenue collected by local government organizations to the total revenue of local government organizations was very small in comparison with the assigned mission. Although the Act on Determining Plan and Procedures in Decentralizations to the Local Administrative Organization, B.E. 2542 (1999) has attempted to increase this proportion, the government has been unable to increase the income to a determined level, which leads to the amendment of the Act on Determining Plan and Procedures in Decentralizations to the Local Administrative Organization in 2006. Clear determination of the roles and responsibilities of local government organizations enable the size and needs of local government organizations to seek resources from different sources under its scope. Central government support is also important. For example, if local government organizations have very few missions, the central government will bear a fiscal burden in terms of interfering with the service provision of the local government. On the other hand, if local government organizations are assigned too great a workload, despite a decrease in the central government's fiscal burden, they would have to bear more responsibilities in spite of the limited sources of revenue. Other duties of the central government, such as the creation of equality in service provision and maintenance of economic stability, are much more effective if performed by the central government. More importantly, the fiscal decentralization of Thailand should be performed for both revenue and expenditure, as focusing only on either side may cause problems currently being seen; that is, local government organizations with insufficient revenue to cover all necessary expenses. This makes it impossible for local government organizations to avoid seeking grants. Therefore, in order to balance fiscal decentralization, the fiscal power in terms of revenue should be appropriately distributed, such as the determination of the types and rates of taxes to be collected, which may be similar or different in each locality, in order to enable inter-

jurisdictional competition, which leads to the enhancement of public service provisions and economic growth.

2) Enhancing the efficiency of tax imposition. The study finds that local government organization can collect only a small amount of tax, rendering them unable to determine their own policies independently. The central government could not allocate more than 35 percent of its revenue to local government organizations by 2006, which affects the overall possibility of decentralization, causing fiscal imbalance. In other words, fiscal decentralization is more focused on expenses than revenue, resulting in most local government organizations relying on grants determined by the Committee of Decentralization to Local Government Organization. Criteria are changed on an annual basis, affecting local development plans. Therefore, local government organizations must enhance the efficiency of taxation. Chinnasri, Ruangsom, and Mala (2015) suggests a way to enhance the efficiency of existing taxation is by promoting tax payment through a variety of channels and allowing people to take part in – and acknowledge – the utilization of taxes and fees collected. People should know about and understand the amounts, procedures, and penalties related to taxation so that they can accept complete tax payments. In addition, officers whose work is related to revenue collection should be provided with opportunities to develop themselves through ongoing skill trainings. Tanchai et al. (2015) propose four types of new revenue sources for the local government, including the following: 1) user charges, which would be collected from the services provided by the local government; 2) commercial and social affairs conducted by local government organizations in the form of local public enterprises and social enterprises; 3) the development of the local economy through incentives by inviting the private sector to invest in the locality, as well as promoting public private partnerships; and 4) loans/bonds through commercial banks or government-affiliated financial institutions. However, the above proposals have problems and difficulties and possible advantages, disadvantages and impacts, which should be considered. Pattamasiriwat (2008) and a Varanyuwattana (2011) propose that property taxes should be amended. Originally, this tax was collected by local government organizations in the form of property and land tax and local maintenance tax whereby the property and land tax were collected based on the revenue in the form of annual rent, which is not in line

with the actual concept of taxation. Local maintenance tax has not been updated. Therefore, tax calculation should be adjusted using property value as the main calculation basis.

3) Increasing the portion of general grants to make sure that local government organizations have sufficient revenue for their missions and to create fiscal balance. As the fiscal decentralization of the Thai local government organization faces a fiscal imbalance problem in that expenditure exceeds revenue, the central government has tried to solve the problem by enabling local government organizations to have sufficient revenue for its missions by increasing grants and revenue allocated to compensate for the vertical imbalance. Grants should create equality between local government organizations (horizontal imbalance) since the taxation ability varies in each locality and according to the economic growth and natural resources of each locality. Therefore, it is necessary to rely on grants to create fiscal equality between local government organizations by allocating the grants to allow local people to receive sufficient and complete public services.

However, Laovakul (2012) argues that Thailand's subsidy allocation system has at least two problems. First, local government organizations cannot expect the amount of grants to be received each year due to changes in the economic situation and government policies. Secondly, the criteria used for allocation of grants is not systematic and therefore, difficult for local government organizations to plan their spending. Moreover, subsidy allocation has become a political issue as representatives on the Committee of Decentralization to Local Government Organization have their own interests. For this reason, the allocation of grants to local government organizations should focus on increasing the portion of general grants. Wiwatchankij (2005) finds that general grants could downsize the government as general grants provided by the central government to local government organizations can be used to determine policies to fulfill local peoples' needs without conditions. According to political mechanisms, local executives can effectively determine the policies and hence downsize the central government. On the other hand, specific grants increase the size of the central government, as specific grants are used by to interfere with local operations. Therefore, these types of grants cannot fulfill local peoples' needs, yet they increase central government monopoly. Nevertheless, the provision of a

larger proportion of general grants should be made consistent with local government missions, and this should reduce gaps in the vertical and horizontal imbalances.

In addition, subsidy allocation should be made using a clear formula in order to ensure mission transparency and the certainty of the allocation to local government organizations and to reduce political influence. The efficiency and effectiveness of the formula used for allocation should be regularly evaluated and modified in order to ensure that it can solve fiscal problems in an appropriate way. Varanyuwattana (2011) proposed that the following issues should be taken into account for the formula used for allocating the grants:

(1) Allocate grants according to the needs of each locality by considering such indicators as intensity, area size, the size of the population which is lower than the poverty line, and the proportion of the elderly and teenage population.

(2) Arrange local government organizations to have naturally low capacity in order to receive more grants to create fiscal equality.

(3) Make local government organizations increase attempts to collect its own taxes by including tax efforts in the formula calculation.

(4) Balance necessary revenue and expenditure fiscal decentralization.

4) Local government organizations should focus on using budgets to enhance productivity of local human resources since they are the key foundation for economic development. Many studies, including those of Jitsuchon (2012) and Chanvit and Sasiwutthiwat (2013), argue that the steady low expansion of Thailand's economy is due to the lack of quality of Thai labor working in different fields or at lower than capacity and the lack of development and improvement of human capital. Jitsuchon (2013) indicate that Thai education has both qualitative and quantitative problems since the majority of Thai education is under government control, while the private sector has a limited role. Moreover, the Thai educational market is supply driven, resulting in inconsistency between productivity and the labor market. The studies also find that new graduates in some fields lack essential skills for practical work. In order to upgrade regional economic growth, it is necessary that local government organizations determine clear strategies related to human resource development to support the regional economy, such as the creation of school-level

databases to build inter-school competitive mechanisms for educational development, the creation of educational collaborative mechanisms between the public and private sectors whereby the private sector should be involved in determining the instructional contents, required skills, and the creation of work-based learning.

In addition to direct human resource development, local government organizations should invest in utilities for the benefit of human resource development. Thawornkrai Wong, Sirilai, and Kedpittaya (2011), studied the government's investment in major utilities, including roads, electricity, and water supply, finding that investment in major utilities stimulated private investment and increased labor productivity, whereby local government organizations should have developmental strategies consistent with future local industrial structure. Moreover, the research suggests that government investment in large industrial areas would yield more productivity than investment in small industrial areas and the investment in road construction would result in a higher level of increasing returns to scale (IRS) than investments in electricity and water supply construction, since the network nature of roads would benefit the exchange and movement of production components. More importantly, investment in the network utilities, including roads, significantly impacts the development of the capital-intensive industries. All of the above factors should be considered by the local executives in determining local development strategies.

5) Improving the efficiency of the government sector and political-economic structure. Local government organizations and agencies are important actors driving national growth. Jitsuchon (2012) argues that government agencies can be the biggest threats to long-term economic growth since most problems their fault, including the lack of skilled and unskilled labor, ineffective production, political relationships, personal interests/corruption, and small amounts of local taxation, leading to insufficient budgets for local development. If local government organizations can regulate and solve the problems appropriately, Thailand's economic development could be much higher.

Moreover, Jitsuchon (2014) argues that corruption and policy corruption, by creating new rules for personal benefit, must be controlled under strict rules. Political negotiating power should be given to the people to a greater extent and political reform should be done in a way to meet peoples' needs. Also, the

government system must be reformed for greater efficiency and effectiveness in operations.

Phongpaichit and Benyaapikul (2014) point out that the cause of the low economic growth in Thailand is the concentration of political power in the hands of the minority, which hinders national economic reform. The concentration of political power is caused by several groups of powerful people, including senior government officials, high-ranking soldiers in the army, influential businesspeople, and senior judicial officers derived from the absolute structure of the monarchy. These political-economic networks greatly influence Thailand and the determination of national and local policies. It is suggested that decentralization, adjustment to a democratic society and civil society campaigns should be carried out in order to balance power. Additionally, the area for the reform of decentralization should be given to support the process of decentralization since local people obtain benefits from such processes. Groups to support and demand decentralization and a democratic society should be established. However, these attempts will face opposition by the central government. Change will come through the social power of the people, although this will take time. Nevertheless, change could be accelerated if conservative groups were invited to lead reform in order to prevent conflicts.

Policy recommendations for the development of inclusive growth are made as follows:

- 1) It is necessary to enhance the fair collection of taxes at the local government level. In 2019, the government terminated the 1932 House and Land Tax Act and the 1965 Local Maintenance Tax Act and introduced the 2019 Land and Buildings Tax Act with a corresponding revision of tax rates. The disadvantage of the 1932 House and Land Tax Act is that it allowed property owners to shift taxes to tenants. Therefore, actual taxpayers were not those who are obligated to pay taxes, which goes against the principle of certainty and leads to greater inequity in taxation. The 1965 Local Maintenance Tax Act specifies that the tax base is the moderate price of land in 1978-1981. Thus, the act is outdated and does not reflect equity, as the current land values are much higher than in the past.

The disadvantages of the 1932 House and Land Tax Act and the 1965 Local Maintenance Tax Act were resolved in the 2019 Land and Buildings Tax Act.

According to the new act, local government organizations shall collect land and building taxes based on the types and uses of property, which are divided into 1) land, 2) buildings, and 3) condominium units, in order to reflect the ability-to-pay principle. This is because different uses of property bring about different benefits to property owners. Moreover, when a tax base is newly defined as the total value of land and buildings, all kinds of property owners are included in the tax system with a wider tax base. When the tax burden is distributed to all property owners, it will result in a fairer tax system. However, it should be noted that setting lower tax rates for unused land is not a solution to the problem of land ownership, which is part of today's social inequality.

In order to solve the outdated value of land specified in the 1965 Local Maintenance Tax Act, local government organizations are required to announce assessed value of property, tax rates and relevant details by February of each year. This is to solve the problem of outdated data and enhance equality according to good tax policy.

2) The allocation of grants to local government organizations should pay attention to income distribution equality and poverty alleviation. The allocation criteria should be determined by considering the proportion of the poor, the poverty gap ratio¹, and special subsidies for poverty alleviation. Local government administrators should formulate policies to support the poor with no public welfare opportunities so that they have access to basic resources and services such as education and public health. This will help to reduce inequity in income distribution.

3) The implementation of economic policies that aim to solve income distribution inequality and poverty is a complicated process, requiring a causal analysis of poverty associated with various political, social, and economic factors. Many government policies are formulated to promote economic growth in order to create benefits for the poor. Some of them are successfully implemented and lead to

¹ Poverty gap ratio indicates the difference between the poor's income and the poverty line. The poverty gap ratio is calculated from the average monthly income per person of the poor. Those who fall much below the poverty line tend to experience more difficulties.

economic expansion such as tourism promotion policies, commercial bank loan promotion policies, and industrial promotion policies. However, the study finds that the beneficiaries of many policies are middle-class people in urban areas, while the benefits do not reach the poor in rural communities due to various obstacles, such as the lack of education, information, professional knowledge, and self-dependency. No access to public services and assistance leads to economic and social inequality. Therefore, policymakers have to thoroughly analyze related problems and determine appropriate public policy for the poor.

4) In order to encourage all sectors in society to participate in the formulation of public policies, the decentralization of political, fiscal, and administrative to local government organizations should not only focus on form but also substance. In other words, the decentralization should not only provide local government administrators with opportunities to promote themselves through policy implementation for election purposes but should also allow the poor to take part in political activities and gain benefits from their political rights. This will contribute to improved efficiency and productivity of local government organizations and result in a more equitable distribution of income and poverty reduction.

5) Finally, Thai fiscal decentralization policy should increase surcharge and shared tax revenue for the local government organization, especially from value added tax (VAT) and excise tax. This is to make the local government organization have sufficient budget to perform duties that will be transferred from the central government in the future. Although the local government organization normally receives the VAT and excise tax revenue according to the 1991 Administration of Value-Added Tax and Specific Business Income Tax for Local Administration Act, the proportion of allocated revenue is quite small. In addition, personal income tax and corporate income tax should also be allocated to the local government organization as well. As the local government organization has never received revenue from personal income tax and corporate income tax, it is necessary to determine the allocation criteria based on the size of economic activities in each local area in order to reflect the needs for public services. This approach is considered a fiscal tool to reduce inequality and help the poor to have equal access to public services. However, the division of revenue between the central government and the

local government organization should not only focus on the income and expenditure of the local government organization but should also pay attention to the local government organization's independence and fiscal self-reliance. The local government organization should not be treated as a budget receiving unit. Local government organization executives have decision-making power in order to create a mechanism for accountability according to the principles of decentralization.



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Appendix A

Local Government Performance in Thailand

Table A1 Calculation of Efficiency Values Using Data Environment Analysis, 2010-2017

	Province	2010	2011	2012	2013	2014	2015	2016	2017
1	Chiang Mai	0.9629	0.8895	0.8692	0.8716	0.8564	0.8584	0.8724	0.8561
2	Chiang Rai	0.9211	0.8539	0.8905	0.9239	0.9064	0.9352	0.9082	0.9175
3	Phetchaburi	0.8780	0.8729	0.8706	0.8601	0.8870	0.8422	0.8767	0.8412
4	Phetchabun	0.9029	0.9012	0.9005	0.9240	0.9401	0.9582	0.9152	0.9415
5	Loei	0.9097	0.8444	0.9234	0.9082	0.8600	0.9093	0.8844	0.8932
6	Phrae	0.9861	0.9363	0.9783	0.9421	0.9821	0.9499	0.9712	0.9825
7	Mae Hong Son	0.7322	0.6669	0.7974	0.7119	0.7385	0.7464	0.6122	0.6213
8	Krabi	0.8240	0.8914	1.0000	1.0000	1.0000	1.0000	0.9663	0.9903
9	Bangkok	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
10	Kanchanaburi	0.7983	0.7576	0.8569	0.8866	0.8348	0.7582	0.8479	0.8402
11	Kalasin	0.9490	0.8449	0.9260	0.8948	0.9158	0.9245	0.9107	0.9201
12	Kamphaeng Phet	0.8092	0.7602	0.7897	0.8140	0.8222	0.8252	0.8076	0.7767
13	Khon Kaen	0.9261	0.8740	0.8885	0.9077	0.8884	0.9054	0.9244	0.9090
14	Chanthaburi	0.8530	0.8302	0.8954	0.8873	0.8939	0.9141	0.8288	0.8189
15	Chachoengsao	0.9361	0.9293	0.9477	0.9923	0.9087	0.9037	0.8466	0.8880
16	Chon Buri	0.9194	0.8716	1.0000	1.0000	1.0000	1.0000	1.0000	0.9709
17	Chai Nat	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
18	Chaiyaphum	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
19	Chumphon	1.0000	1.0000	0.9023	0.9515	0.8825	0.8534	0.9508	0.8550
20	Trang	0.8380	0.8765	0.8359	0.8589	0.8981	0.8464	0.8138	0.8608
21	Trat	0.8633	0.8633	0.9198	0.9095	0.8585	0.9107	0.8724	0.9402
22	Tak	0.7912	0.7671	1.0000	1.0000	1.0000	0.9668	0.9852	0.8278
23	Nakhon Nayok	0.9339	0.9052	0.9271	0.9033	0.8790	0.8721	0.8608	0.8820
24	Nakhon Pathom	0.9122	0.9234	0.9213	0.9167	0.9276	0.9497	1.0000	1.0000
25	Nakhon Phanom	0.8655	0.8379	0.8339	0.7936	0.8809	0.9027	0.8918	0.9212
26	Nakhon Ratchasima	0.9066	0.8930	0.9080	0.9347	0.8386	0.8632	0.8626	0.9025
27	Nakhon Si Thammarat	0.9840	0.9445	0.9279	0.9347	0.8959	0.8969	0.9052	0.8982
28	Nakhon Sawan	1.0000	1.0000	0.9782	0.9947	0.9712	0.9825	0.9257	0.9159

[illegible]

	Province	2010	2011	2012	2013	2014	2015	2016	2017
65	Sukhothai	0.8707	0.8674	0.8327	0.8470	0.8570	0.8487	0.9908	0.8763
66	Suphan Buri	0.9554	0.9465	0.9560	0.9553	0.9347	0.9554	0.9332	0.9302
67	Surat Thani	0.8452	0.9718	0.8266	0.7981	0.8227	0.8223	0.7853	0.8129
68	Surin	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
69	Nong Khai	0.8917	0.8245	0.8720	0.9210	0.8856	0.9552	1.0000	1.0000
70	Nong Bua Lam Phu	0.9266	0.7937	0.9383	0.9593	0.9251	0.9126	0.9005	0.9104
71	Ang Thong	0.9629	0.9566	0.9523	0.9483	0.9485	0.9492	0.9477	0.9433
72	Amnat Charoen	0.8321	0.7935	0.8142	0.8535	0.7540	0.7521	0.7748	0.7843
73	Udon Thani	0.9237	0.8005	0.9211	0.9490	0.9225	0.9370	0.8970	0.9175
74	Uttaradit	0.9911	0.9268	0.9398	0.9372	0.9162	0.9429	0.9218	0.9438
75	Uthai Thani	0.9243	0.9008	0.9236	0.8916	0.8814	0.8801	0.8812	0.8767
76	Ubon Ratchathani	0.9184	0.8334	0.8877	0.9281	0.8219	0.8218	1.0000	1.0000

Source: calculate

Table A2 Calculation of Productivity Values Using Productivity Index, 2010-2017

	Province	2010	2011	2012	2013	2014	2015	2016	2017
1	Chiang Mai	0.8464	1.2723	1.1904	1.0032	1.1636	0.9637	0.9975	1.2460
2	Chiang Rai	0.8767	1.1285	1.7910	1.0016	1.1139	1.0402	0.9905	1.1856
3	Phetchaburi	0.7997	1.2485	1.8533	0.8186	1.0261	0.8505	1.1888	1.0797
4	Phetchabun	0.6941	1.1136	2.4048	0.8719	1.4523	1.0159	0.9038	1.2819
5	Loei	0.9098	0.9687	2.1551	0.9406	1.0855	1.1656	0.8943	1.1087
6	Phrae	0.8317	1.0361	2.0058	0.9065	1.9347	0.5291	0.9193	1.1009
7	Mae Hong Son	0.7859	1.2906	1.7629	0.8482	1.2794	0.9691	0.5010	1.2962
8	Krabi	0.7994	1.2449	3.1789	0.8691	1.0942	0.8115	1.1168	1.4788
9	Bangkok	0.9250	0.9015	1.0051	0.9167	1.0199	1.1877	1.0252	1.2327
10	Kanchanaburi	0.8944	1.1279	2.0171	0.9167	1.0900	0.8715	1.1083	1.2522
11	Kalasin	0.7456	1.3249	2.0756	0.8856	1.2348	1.1350	0.9196	0.7070
12	Kamphaeng Phet	0.9114	1.2759	1.6359	1.0814	1.2549	0.9203	0.8789	0.7249
13	Khon Kaen	0.8949	1.2125	1.8896	1.0127	1.1440	1.0225	0.8977	1.1774
14	Chanthaburi	0.8495	0.9972	2.3761	0.9677	1.3047	0.9327	0.9139	1.1190
15	Chachoengsao	0.8994	0.9711	2.2102	1.0877	0.9931	1.0111	0.9155	1.5116
16	Chon Buri	1.0218	0.6055	3.7259	0.9652	1.0151	1.1238	1.2758	1.4323
17	Chai Nat	0.8210	1.4103	1.8339	1.0720	1.3440	1.0392	1.0647	1.0814
18	Chaiyaphum	1.2167	1.2337	1.7689	0.7192	1.2037	1.1164	1.2907	1.3588
19	Chumphon	1.0366	0.9234	1.2749	1.1029	0.9821	0.7348	1.6587	0.7572
20	Trang	0.8501	1.3079	0.9553	1.2535	1.2372	0.8286	0.8940	1.8831

	Province	2010	2011	2012	2013	2014	2015	2016	2017
21	Trat	0.8751	0.9991	2.3490	0.8912	0.9285	1.2937	0.9081	1.3972
22	Tak	0.8687	1.4770	1.8415	0.9239	0.8336	1.0028	1.2409	0.9573
23	Nakhon Nayok	0.8323	1.2019	2.0202	0.8309	1.0925	1.0738	0.8158	1.6438
24	Nakhon Pathom	0.8131	1.3767	1.4826	0.9604	1.1290	1.0858	1.3756	1.2724
25	Nakhon Phanom	0.8118	1.1854	2.1017	0.8410	1.3845	0.5008	1.6117	1.3969
26	Nakhon Ratchasima	0.4299	1.2916	1.7665	1.0012	0.9685	1.0747	1.1942	1.3122
27	Nakhon Si Thammarat	0.1449	6.0255	1.2357	0.9846	1.1170	1.0023	0.9263	1.2822
28	Nakhon Sawan	1.2451	2.1221	0.9403	0.9969	1.1627	1.0221	0.6045	1.4526
29	Nonthaburi	0.9034	1.1825	1.2420	0.8084	1.2272	0.9411	1.0447	1.8132
30	Narathiwat	0.6193	1.6581	1.2991	0.8180	0.9535	1.0487	1.0336	1.3599
31	Nan	0.8229	1.2215	2.0820	0.6875	1.2384	1.0076	0.8955	1.4694
32	Buri Ram	0.2228	1.7596	2.2417	0.9169	1.2715	0.8679	0.8513	1.1712
33	Pathum Thani	0.9654	1.1534	1.9857	0.9858	1.1061	0.8387	1.1480	1.1894
34	Prachuap Khiri Khan	0.8806	0.9143	2.2641	1.0737	1.0477	0.9742	1.3150	1.1806
35	Prachin Buri	0.8036	1.5614	1.9764	1.0447	0.9762	0.7899	1.3285	1.2941
36	Pattani	0.7297	1.3338	1.8491	0.7466	1.1572	0.7525	1.0111	1.3012
37	Phra Nakhon Si Ayutthaya	0.9014	0.7253	1.5656	1.2869	1.6167	1.1307	0.9685	1.2022
38	Phayao	0.8611	1.0953	2.0105	0.9928	1.1391	1.0280	0.9929	1.1045
39	Phangnga	0.8199	1.0967	1.7746	1.0268	1.2205	0.9815	0.9460	1.5126
40	Phatthalung	0.5402	0.8011	2.5727	0.9429	1.0858	0.8909	1.5621	0.8837
41	Phichit	0.6725	1.1377	2.0495	0.9693	1.0294	0.8504	1.0677	1.4853
42	Phitsanulok	0.8992	1.2963	1.0082	1.2402	1.1138	1.5067	0.7904	1.4309
43	Phuket	1.0358	1.1532	0.9899	1.0316	1.0874	1.0451	1.8377	1.4484
44	Maha Sarakham	0.7376	1.3573	1.8715	1.0320	1.1481	1.0088	1.0473	0.8276
45	Mukdahan	0.8185	0.9509	2.1925	0.9903	0.6578	1.0389	0.8854	0.8654
46	Yasothon	3.3245	1.3088	1.3715	0.9103	0.6173	1.0765	0.8826	2.7427
47	Yala	0.6953	1.1584	2.5516	0.9050	1.1629	0.7822	1.2034	1.4442
48	Roi Et	0.8322	0.8279	2.6523	1.0287	0.8526	1.5727	0.5992	1.1432
49	Ranong	1.0932	1.1526	1.7109	0.8677	1.1007	1.0824	0.8562	1.5078
50	Rayong	0.8153	0.8702	2.1273	0.8683	1.0569	1.0716	1.0226	1.1403
51	Ratchaburi	0.8925	0.9272	2.2707	0.8662	1.0726	1.1988	0.9067	1.1610
52	Lop Buri	0.8696	1.4152	1.7384	0.9737	1.1357	0.9806	1.0861	1.2150
53	Lampang	0.8559	1.2627	1.4149	1.0978	1.1491	1.0605	0.9619	1.2326
54	Lamphun	0.6553	0.8992	2.1816	0.9603	1.1709	1.1292	1.2604	1.2539
55	Si Sa Ket	1.5264	1.2905	1.8713	0.8363	1.3376	1.0758	1.1213	1.1939
56	Sakon Nakhon	0.8103	1.2690	2.0588	0.9392	0.9504	1.0929	0.9030	1.2081

	Province	2010	2011	2012	2013	2014	2015	2016	2017
57	Songkhla	0.8852	0.8861	1.7289	0.9634	1.0603	1.0515	1.1260	1.2196
58	Satun	0.7052	1.1490	2.2861	0.8428	0.9876	1.1893	0.9730	0.9601
59	Samut Prakan	0.9611	1.1877	2.2025	0.9143	1.2905	1.0632	1.1636	1.2928
60	Samut Songkhram	1.0448	1.1870	2.4005	0.9196	0.9656	0.7788	1.4156	1.2809
61	Samut Sakhon	0.8909	1.1827	1.2341	1.0061	1.4907	1.0291	1.3280	1.2495
62	Sa Kaeo	0.7568	1.2411	1.6573	0.9537	1.1391	0.9841	1.0056	1.9963
63	Saraburi	1.1209	2.0526	1.2486	1.0171	1.0060	0.7025	1.1669	1.1311
64	Sing Buri	0.8054	1.4516	1.6049	0.9651	1.0630	1.1300	0.8249	1.3254
65	Sukhothai	0.8791	1.3326	1.2055	1.0465	1.1345	1.1388	1.7338	0.8089
66	Suphan Buri	0.9545	1.1028	1.9470	0.9885	1.1298	0.9198	0.8196	1.4154
67	Surat Thani	0.7666	1.5016	1.0607	0.9279	1.2103	1.0558	1.0869	1.3554
68	Surin	0.3794	1.0923	2.7880	0.8294	1.1835	0.9560	0.7523	1.2185
69	Nong Khai	0.5122	0.8709	3.6982	1.9580	1.0151	1.3227	0.8018	1.7729
70	Nong Bua Lam Phu	0.8213	0.9576	2.5053	1.1031	1.0880	0.8770	0.7640	1.2387
71	Ang Thong	0.7971	1.2478	1.6586	0.9466	1.1505	1.0489	0.9461	1.3158
72	Amnat Charoen	1.3969	1.0081	1.8601	1.0600	1.2018	1.0379	0.6482	1.7690
73	Udon Thani	1.0992	1.2306	1.8181	1.0110	1.1964	1.0028	0.7851	1.1855
74	Uttaradit	0.7741	1.1298	1.8302	1.2617	0.7448	1.4717	0.9191	1.1296
75	Uthai Thani	0.8330	1.3035	1.7676	0.8341	1.1421	1.0131	1.0721	1.0572
76	Ubon Ratchathani	0.1889	0.8364	2.9820	0.9378	0.8539	0.9922	1.7377	1.5237

Source: calculate

Appendix B

Interviews Executives of the Local Government Organizations and Related Provincial Government Organizations

Samut Sakon Province

1. Mr. Chingchai Bunpraklong Municipality City Clerk of Samut Sakon. The interview was carried out on 3 August 2020.
2. Mrs. Viparat Wunnuch Director of Samut Sakon Provincial Office of Local Administration. The interview was carried out on 29 November 2020.
3. Mr. Wattana Pornprasert Director of Samut Sakon Provincial Office of Natural Resources and Environment. The interview was carried out on 29 November 2020.

Saraburi Province

1. Mr. Suthorn Kemnak Sub-District Municipality Mayor of Nong Khae. The interview was carried out on 20 August 2020.
2. Mrs. Petcharat Lerdrat Director of Saraburi Provincial Office of Local Administration. The interview was carried out on 14 January 2021.
3. Mr. Komest Putthason Director of Saraburi Provincial Office of Natural Resources and Environment. The interview was carried out on 14 January 2021.

BIOGRAPHY

Name-Surname

Mr.Thitinat Wiwatchankij

Academic Background

- Bachelor of Political Science (Public Administration), Thammasat University, Bangkok, Thailand in 2000
- Master of Economics, Thammasat University, Bangkok, Thailand in 2005
- Master of Business Administration (Finance), National Institute of Development Administration, Bangkok, Thailand in 2010

Experience

- Industrial Analyst Officer in Department of Industrial Promotion in 2004
- Analyst Officer in Research Department, Bangkok Bank in 2010
- Senior Manager in Advisory Group 2, TRIS Corporation in 2010-Present

